

Contribution to the taxonomy of the *Oecetis (Oecetis) tripunctata* (Fabricius, 1793) species group (Trichoptera: Leptoceridae)

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Abstract. Unsettled, dubious *Oecetis tripunctata* taxa are studied applying the principles and practices of fine phenomics relying on the ventral profile of the gonopods and the lateral profile of the phallic organ. The distribution of *Oecetis tripunctata* (Fabricius, 1793) is restricted to the Palaearctic Faunal Region. 14 new species were described from the Oriental Faunal Region: *Oecetis anhua* s. nov., *O. baneswara* sp. nov., *O. baoloca* sp. nov., *O. bhubaneswa* sp. nov., *O. dagna* sp. nov., *O. dhaulia* sp. nov., *O. gujara* sp. nov., *O. halonga* sp. nov., *O. hoabinha* sp. nov., *O. kamba* sp. nov., *O. orissa* sp. nov., *O. peraka* sp. nov., *O. prenna* sp. nov., *O. sabarma* sp. nov. and one species *Oecetis lata* Johanson, Pham, Malm & Sjöberg, 2020 was recorded from Vietnam. 2 new species were described from Australasian Faunal Region: *O. kokopa* sp. nov., *O. parom* sp. nov. as new records of the *Oecetis tripunctata* species group. 10 new species were described from the Afrotropical Faunal Region, including mainland Africa and Madagascar: *O. anka* sp. nov., *O. banda* sp. nov., *O. bua* sp. nov., *O. conga* sp. nov., *O. congana* sp. nov., *O. ghana* sp. nov., *O. manta* sp. nov., *O. maroa* sp. nov., *O. volta* sp. nov., *O. zoa* sp. nov., and one species *Oecetis kagerana* Kimmins, 1956 was recorded from Ghana, as well as *O. maculipennis* Ulmer, 1922 was placed to the *Oecetis tripunctata* species group. This replacement has necessitated revising and renaming the *Oecetis maculipennis* species group describing 2 new species: *O. kimminsiiana* sp. nov. and *O. nkwanta* sp. nov. *Oecetis maculipennis* species group was renamed as *Oecetis kimminsiiana* species group.

Keywords. Caddisflies, fine phenomics, speciation trait, *Oecetis*, new species.

INTRODUCTION

Oecetis tripunctata (Fabricius, 1793) was long treated as a species with very wide distribution and with highly varying specific character states of stepwise cross-vein anastomosis pattern on forewing and of the simplified shape of the gonopods. Therefore every taxonomist working on its identity from various faunal regions have determined specimens as *tripunctata* and set aside for a necessary revision (Yang & Morse 2000, Malicky 2005, Oláh & Malicky 2011, Oláh & Mey 2013). Such specimens were identified as *tripunctata* from Palaearctic Faunal Region (Austria, Bulgaria, France, Germany, Greece, Portugal, Russia, Syria), Oriental Region (India, Indonesia (Sumatra, Nias, Sulawesi, Bali), Laos, Malaysia (Perak, Sarawak), Nepal, Philippine, Sri Lanka, Taiwan, Thailand, Vietnam) (Malicky 2005, Oláh & Malicky 2011), from Australasia (Papua New Guinea) (Oláh &

Mey 2013) as well as several species were listed as potential synonyms from the Afrotropical Region (Yang & Morse 2000). It was clear that a major revision is seriously needed to sort synonyms from valid species in this complex (Yan & Morse 2000, Malicky 2005).

Working on our Trichoptera material collected in Batanta Island (Indonesia, West Papua) we have discovered a single male specimen from this *tripunctata*-like complex of species. To complete our Batanta Island study I have decided to revise all my specimens from the Palaearctic, Oriental, Australasian and Afrotropical Faunal regions set aside earlier as similar to *Oecetis tripunctata*.

Starting to work on the specimens of the *Oecetis tripunctata* species group it was discovered that the nominate species of the *Oecetis maculipennis* Ulmer, 1922 species group established by Chen (1993) and confirmed by Yang &

Morse (2000) is actually a typical member of the *Oecetis tripunctata* species group. Therefore I have revised this small group of species composed only of four species in order to transfer *Oecetis maculipennis* to the *Oecetis tripunctata* species group and rename the group of *Oecetis maculipennis*.

MATERIAL AND METHODS

Careful comparative analysis applying the principles and practices of fine phenomics was focused to search speciation traits exhibiting highest morphological diversity and lowest variability in order to delineate incipient sibling species. Moreover, to have simple and reliable trait accessibility in daily routine taxonomical studies was a primary target including searching stability of the observational angle as well as comparability and exact reproducibility of the character states. The ventral profile of the gonopods proved to be a diverse and stable, not variable character together with the lateral profile of the phallic organ. These genital structures form the basis to delineate species in the *Oecetis tripunctata* species group. Both the lateral and dorsal profile of the segment X is rather instable due to great shape variability and liability to distortion during copulation and preparation. The lateral profile of the gonopod is highly observation angle sensitive due to its dorsal ridge pattern.

In this paper I have drawn the phallic organ in lateral view, just by outlining its exact lateral profile together with the paramere. The apical margin the phallic organ is discernible as membranous due to the variously extruded endotheca. This region of the phallic organ is drawn by thinner line. The phallic structure is represented by phallic apodeme, phallic shield, sclerotized strips of phallic shield, phallobase, phallotheca, endotheca, endothecal membrane, paramere, U-shaped phallotremal sclerite and ejaculatory duct. The position and visibility of the endothecal membrane, U-shaped phallotremal sclerite and the ejaculatory duct are unstable depending on the erection state of the organ as well as on the

preparation processes; their diagnostic value is low, therefore they are not drawn.

In species description and diagnosis the focus was directed to the speciation traits of the gonopod and to the phallic organ stably diverging among species. There are possible divergences also in wing venation, wing colour and pattern. However, I have all the frequently very old specimens stored in alcohol, therefore wing pattern and colour is not reliably preserved for a comparative study. I have detected only the regular or irregular character states of the step-wise cross-vein pattern on forewing.

Depositories. Nanjing Agricultural University, Nanjing, Jiang-xi Province, China (NAU). Oláh Private Collection, Debrecen, Hungary, under national protection by the Hungarian Natural History Museum, Budapest (OPC).

TAXONOMY

Species groups in the *Oecetis* (*Oecetis*) MacLachlan, 1877 subgenus

The genus *Oecetis* MacLachlan, 1877, is one of the largest among caddisflies, populating both the lentic and the lotic habitats, frequently abundant and distributed throughout the world in all faunal regions. The genus is divided into four so called monophyletic subgenera (Chen 1993). *Oecetis* (*Oecetis*) MacLachlan, 1877 subgenus is characterized with character states of (1) one paramere spine in the phallus; (2) the absence of upper part of male segment X; (3) cerci frequently fused to segment X; (4) phallic organ frequently globular; (5) paramere as long as phallus.

Seven species groups have been recognised in the *Oecetis* (*Oecetis*) subgenus (Chen 1993). Delineation of species group is based on six randomly selected characters, reflecting the speculative nature of phylogeny and the reality of chimerism that is the retigeny or dikiogeny, the dominance of incongruences in integrative organisation: anastomosis cross-vein pattern on fore-

wing, sternum IX, segment X, cercus, gonopod and phallotheca.

(1) *Oecetis* (*O.*) *unicolor* group is confined to the Australasian Region. Characterized by phallotheca with right anterolateral lobe and posterior end with dorsal process covering paramere.

(2) *Oecetis* (*O.*) *tripunctata* species group is distributed in the Palaearctic, Oriental, Australasian and Afrotropical Regions. Characterized by broad cerci completely fused to segment X and by simple, elongated and medially separated gonopods; forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by at least its length.

(3) *Oecetis* (*O.*) *furva* species group is distributed in Palaearctic, Nearctic, Afrotropical and Neotropical Regions. Characterized by sternum IX with membranous posterior pit reaching between gonopods.

(4) *Oecetis* (*O.*) *ochracea* species group is distributed in Palaearctic, Nearctic and Oriental Regions. Characterized by gonopods with basoventral lobe visible in lateral view.

(5) *Oecetis* (*O.*) *lacustris* species group is distributed in Palaearctic and Oriental Regions. Characterized by gonopods with mesal edges of basal portions smooth and touching or closely approximate for at least 1/3 of their length in ventral view, generally broad and short.

(6) *Oecetis* (*O.*) *bicuspidata* species group is distributed in the Afrotropical Region. Characterized by gonopods with mesal edges of mesobasal lobes smooth and approximate for no more than 1/4 in their length in ventral view, phallus with left anterior lobe membranous.

(7) *Oecetis* (*O.*) *kimminsiana* species group is distributed in the Afrotropical Region. Characterized by gonopods with mesal edges of mesobasal lobes sharply toothed and approximate for no more than 1/4 in their length in ventral view; phallus with left anterior lobe sclerotized. This species group was named originally as *Oecetis* (*Oecetis*) *maculipennis* by Chen (1993) in his PhD Thesis work and accepted later by Yung & Morse (2000). Their suggestion was based on the misidentification of Kimmins (1962). Kimmins

has presented and drawn *Oecetis kimminsiana* sp. nov. erroneously as *Oecetis maculipennis* Ulmer, 1922. *Oecetis maculipennis* is a typical member of *Oecetis tripunctata* species group with corresponding genital structure, but irregular stepwise pattern of the anastomosis cross-veins, similarly to many more Afrotropical species of the *O. tripunctata* group.

***Oecetis* (*Oecetis*) *tripunctata* (Fabricius, 1793) species group**

This poorly known species group is distributed in the Palaearctic, Oriental, Australasian and Afrotropical Regions. Characterized by broad cerci completely fused to segment X and by simple, elongated and medially separated gonopods. Forewing anastomosis cross-veins are arranged in stepwise; transverse base of MA is distad of transverse base of MP3+4, by at least its length. However, this apomorphic cross-vein pattern is unstable and liable to perturbation and reversion. Several species in the Afrotropical Region with typical genital structure of cerci and gonopods exhibits irregular stepwise patterns of cross-vein anastomosis.

West Palaearctic species

***Oecetis tripunctata* (Fabricius, 1793)**

Material examined. France, St. Saven, River Gartempe, 9. VII. 1986, light leg. J. Oláh (7 males, OPC). Hungary, Bucsa, Hortobágy-Berettyó canal, 15. VII. 1962., singled leg. J. Oláh (4 males, 2 females; OPC). Hungary, Bucsa, Hortobágy-Berettyó canal, 19. VII. 1964, singled leg. J. Oláh (3 males, 1 female; OPC). Hungary, Hortobágy National Park, Bátorliget, 3. VII. 2010, light leg. J. Oláh & M. Oláh (6 males, 2 females, OPC). Hungary, Pocsaj, River Ér, 12. VII. 2010, light leg. J. Oláh (2 females, OPC). Hungary, River Öregtúr at Petőfi Tree of Nagyar, 16.VII.2010 light leg. J. Oláh (8 males, 4 females, OPC). Hungary, River Batár at Magosliget, 20.VII.2010 light leg. J. Oláh (16 males, OPC). Hungary, River Gömö-Szenke at Nagyszekeres, 13. VIII. 2010 light leg. J. Oláh & R. Horváth (3 males, OPC).

Oriental species

***Oecetis anhua* sp. nov.**

Oecetis tripunctata (Fabricius, 1793): Yang & Morse 2000: 119–121. Misidentification.

Material. Holotype: **China**, An-hui Province, Jin Xian, N30.70, E118.35, Song-cun, Ding-xi-he, 33 km E of Jin Xian, 120 m elevation, 8.VI, 1990, leg. J. Morse & C. Sun (1 male, NAU).

Diagnosis. (After Yang & Morse 2000). Specimens from Anhui, Fujian, Jiangsu, Sichuan and Yunnan provinces were identified as new Chinese record of *Oecetis* (*O.*) *tripunctata* (Fabricius, 1793). The new species *Oecetis anhua* differs from *Oecetis tripunctata* (Fabricius, 1793) by both the lateral and ventral shape of the gonopods. The lateral profile of the gonopods possesses pronounced basodorsal and basoventral lobes lacking at *O. tripunctatus*. The apical half of the gonopod narrowing with mesad turning apex, not mesad spatulate.

Description. After Yang & Morse, 2000:119–121; 246: figures: 132 A,B,C,D.

Head, thorax, scape reddish brown. Forewing rubbed in alcohol, membrane hyaline of 7.5–7.9 mm length. Forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

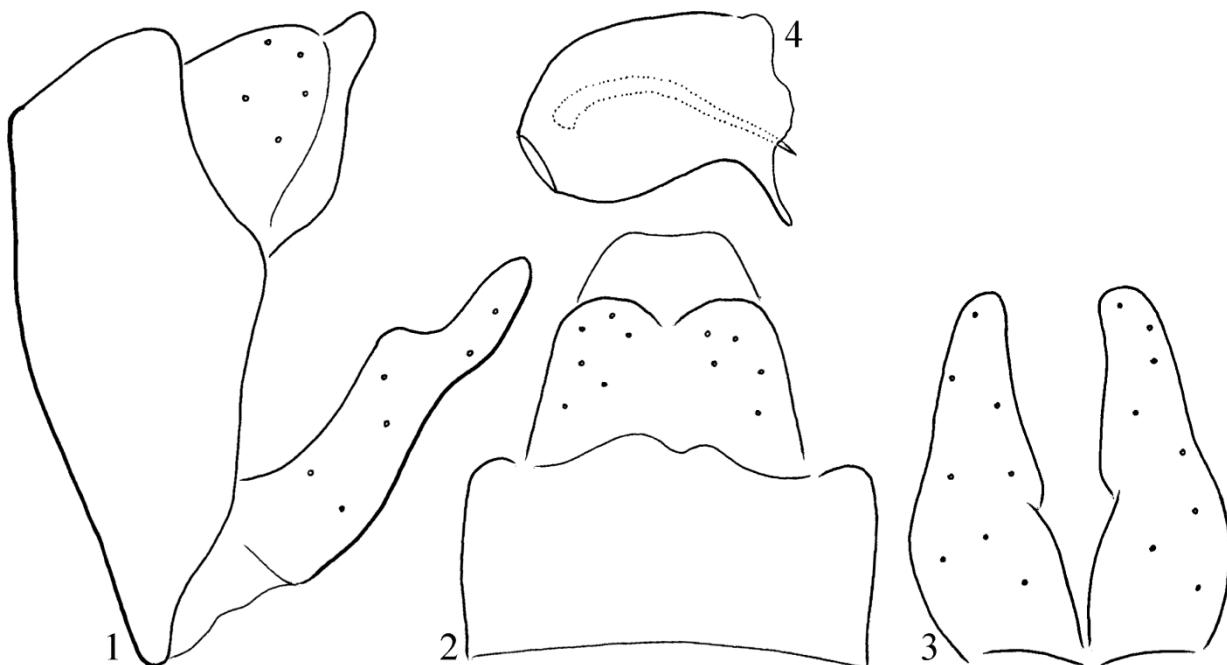
Etymology. Coined after the name of locus typicus, a noun in apposition.

***Oecetis baneshwara* sp. nov.**

(Figures 1–4)

Material examined. Holotype: **India**, Orissa State, near Bhubaneswar, Dhauli, marsh, 20–28.II.1987, light leg. J. Oláh (1 male, OPC). Paratype: same as holotype (5 males, OPC).

Diagnosis. *Oecetis baneshwara* sp. nov. has resemblance to *Oecetis orissa* sp. nov. another species collected from the same marshy area in



Figures 1–4. *Oecetis baneshwara* sp. nov. Holotype: 1 = male genitalia in left lateral view, 2 = male genitalia in dorsal view, 3 = gonopods in ventral view, 4 = phallic organ in left lateral view.

Dhauli, Orissa State, but a single paratype also from Gujarat State. *Oecetis baneshwara* is distinguished from *O. orissa* by having longer tergum IX and shorter sternum IX; dorsal profile of segment X almost truncated, not excised; lateral profile of gonopod with undulating, not straight ventrum; ventral profile of gonopod with long, not short apical mesad produced region. Phallic organ with almost right angled and slender, not obtuse angled and robust apicoventral lip.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. Forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX with long tergum and very short ventrum. Lateral profile of segment X with slightly upward directed apex, truncated in dorsal view. Cerci completely fused to segment X, as long as high in lateral view. Lateral profile of gonopod with stepwise ending, long mesal a-

pex in ventral view. Apicoventral lip of the phallic organ almost right-angled and slender.

Etymology. Coined after the name of locus typicus, a noun in apposition.

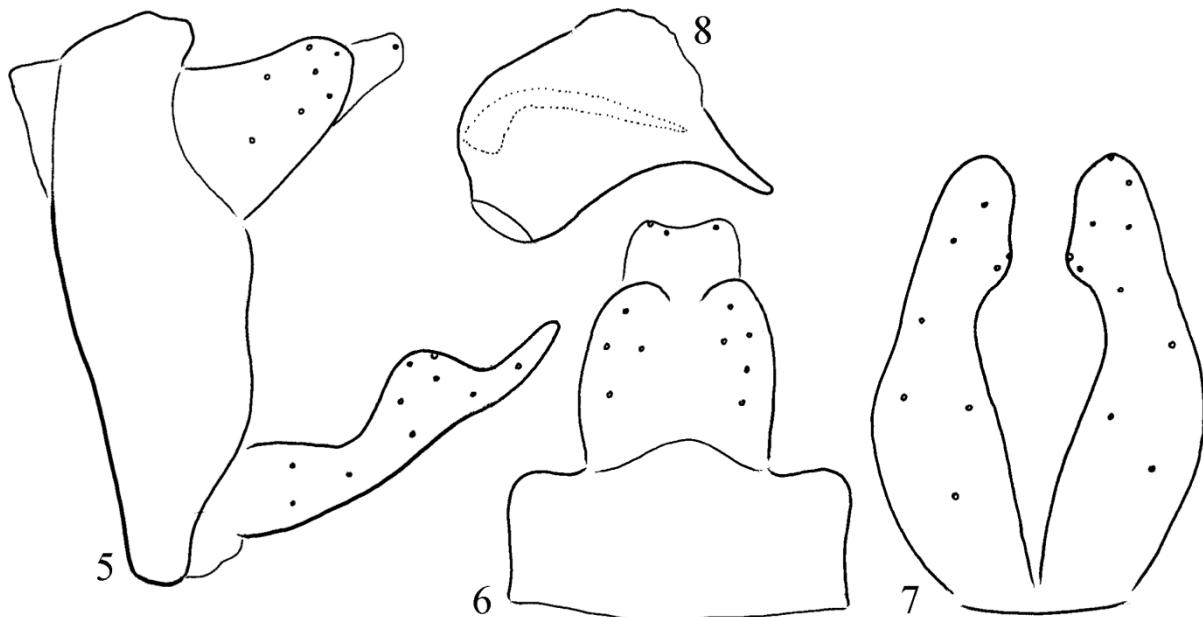
***Oecetis baoloca* sp. nov.**

(Figures 5–8)

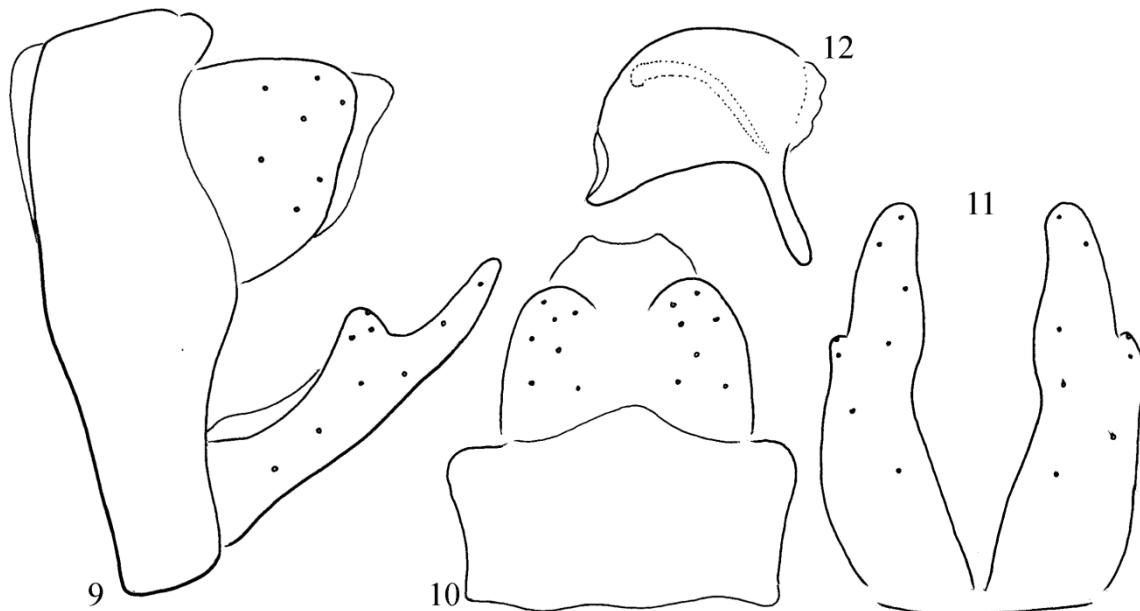
Oecetis tripunctata (Fabricius, 1793): Oláh 2013:129. Misidentification.

Material examined. Holotype: **Vietnam**, Lam Dong Province, Baoloc, Dai Binh River, 22.X. 1988, light leg. J. Oláh (1male, right wings embedded in permanent preparates, OPC). Paratypes: same as holotype (6 males, OPC).

Diagnosis. *Oecetis baoloca* sp. nov. has resemblance to *Oecetis hoabinha* sp. nov. but distinguished by having shorter sternum IX; dorsal profile of segment X slightly excised and long (wide), not rounded and short (narrow); lateral profile of gonopod with undulating, not straight



Figures 5–8. *Oecetis baoloca* sp. nov. Holotype: 5 = male genitalia in left lateral view, 6 = male genitalia in dorsal view, 7 = gonopods in ventral view, 8 = phallic organ in left lateral view.



Figures 9–12. *Oecetis bhubaneswa* sp. nov. Holotype: 9 = male genitalia in left lateral view, 10 = male genitalia in dorsal view, 11 = gonopods in ventral view, 12 = phallic organ in left lateral view.

ventrum, ventral profile of gonopod with short apical region strongly mesad produced. Phallic organ with more obtuse angled apicoventral lip.

Description. Head, thorax, scape light brown yellowish in alcohol. Forewing rubbed in alcohol, membrane hyaline of 8 mm length, forewing a-nastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX with slightly longer tergum than ventrum. Lateral profile of segment X visible as a simple lobe, a continuation of cerci, truncated quadrangular in dorsal view. Cerci fused to segment X, longer than high in lateral view. Lateral profile of gonopod with strong middle lobe, very short mesal apex in ventral view. Apicoventral lip of the phallic organ obtuse angled and tapering.

Etymology. Coined after the name of locus typicus, a noun in apposition.

Oecetis bhubaneswa sp. nov.

(Figures 9–12)

Material examined. Holotype: India, Orissa State, near Bhubaneswar, Dhauli, marsh, II.1983, light leg. J. Oláh (1 male, OPC). Paratype: same as holotype (5 males, OPC). India, Orissa State, near Bhubaneswar, Dhauli, marsh, 8–10. III.1985, light leg. J. Oláh (1 male, OPC). India, Orissa State, near Bhubaneswar, Dhauli, marsh, 16. III.1985, light leg. J. Oláh (6 males, OPC). India, Orissa State, near Bhubaneswar, Dhauli, marsh, 30. III.1985, light leg. J. Oláh (1 male, OPC). India, Orissa State, near Bhubaneswar, Dhauli, marsh, 30. III.1985, light leg. J. Oláh (1 male, OPC). India, Orissa State, near Bhubaneswar, Dhauli, marsh, 22. II.1987, light leg. J. Oláh (28 males, OPC).

Diagnosis. *Oecetis bhubaneswa* sp. nov. has resemblance to *Oecetis baneswara* sp. nov. but distinguished by dorsal profile of segment X almost truncate, not excised; lateral profile of gono-

pod with straight, not undulating ventrum and the subapical dorsal lobe more produced; ventral profile of gonopod with shorter apical region pronouncedly mesad produced. Phallic organ with more produced apicoventral lip.

Description. Head, thorax, scape light brown yellowish in alcohol. Forewing rubbed in alcohol, membrane hyaline of 8 mm length, forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX straight anterad with longer tergum than ventrum. Lateral profile of segment X visible as short vertical setaless continuation of cerci, rounded laterad and slightly excised in dorsal view. Cerci fused to segment X, shorter than high in lateral view. Lateral profile of gonopod with strong, high and short middle lobe, long mesal apex and a small lateral lobe in ventral view. Apicoventral lip of the phallic organ obtuse-angled long and digitiform.

Etymology. Coined after the name of locus typicus, a noun in apposition.

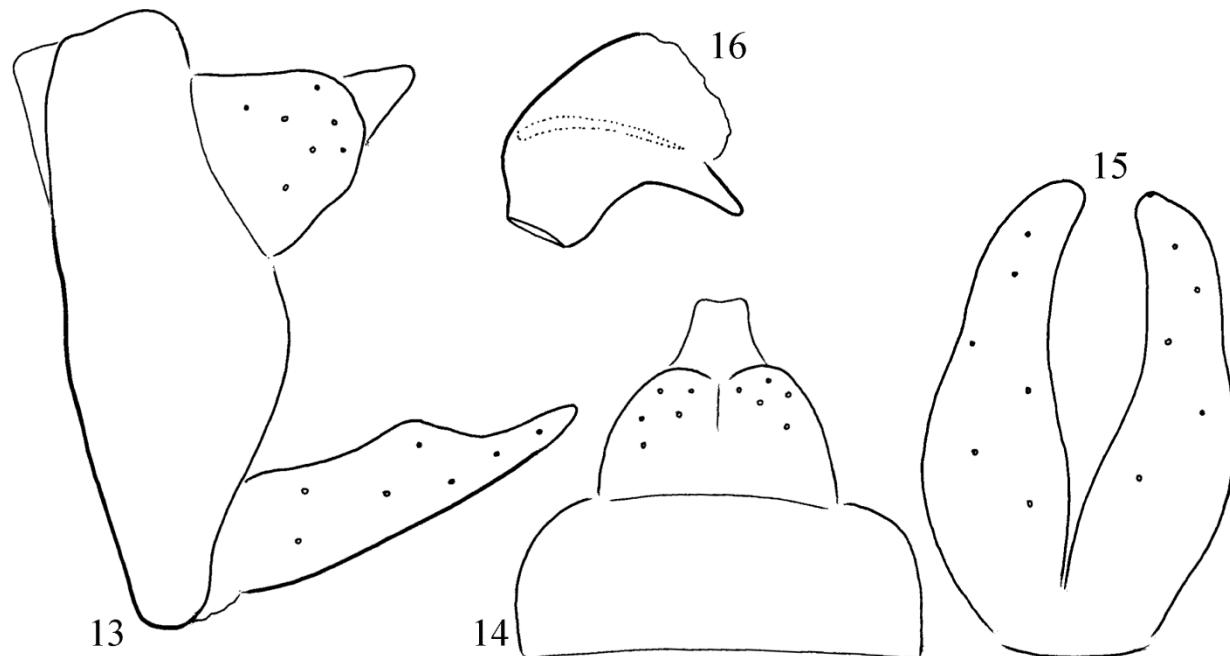
***Oecetis dagna* sp. nov.**

(Figures 13–16)

Oecetis tripunctata (Fabricius, 1793): Oláh 2013:129.
Misidentification.

Material examined. Holotype: **Vietnam**, Lam Dong Province, Baoloc, Da Gna River, 21.X. 1988, light leg. J. Oláh (1male, OPC).

Diagnosis. *Oecetis dagna* sp. nov. has resemblance to *Oecetis hoabinha* sp. nov. but distinguished by dorsal profile of segment X slightly excised, not rounded; lateral profile of gonopod with almost straight, not with concave basodorsum; ventral profile of gonopod with mesad produced apex, not simply rounded and subapical dorsal lobe produced visible. Phallic organ with more robust apicoventral lip.



Figures 13–16. *Oecetis dagna* sp. nov. Holotype: 13 = male genitalia in left lateral view, 14 = male genitalia in dorsal view, 15 = gonopods in ventral view, 16 = phallic organ in left lateral view.

Description. Head, thorax, scape light brown yellowish in alcohol. Forewing rubbed in alcohol, membrane hyaline of 8 mm length, forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX rounded posterad. Lateral profile of segment X visible as short triangular, setaless continuation of cerci, narrow and long in dorsal view. Cerci fused to segment X, shorter than high in lateral view. Lateral profile of gonopod two-partite; long quadrangular basal and digitiform tapering apical region; simple, elongated and tapering in ventral view. Apicoventral lip of the phallic organ obtuse-angled short and tapering.

Etymology. Coined after the name of locus typicus, a noun in apposition.

Oecetis dhaulia sp. nov.

(Figures 17–20)

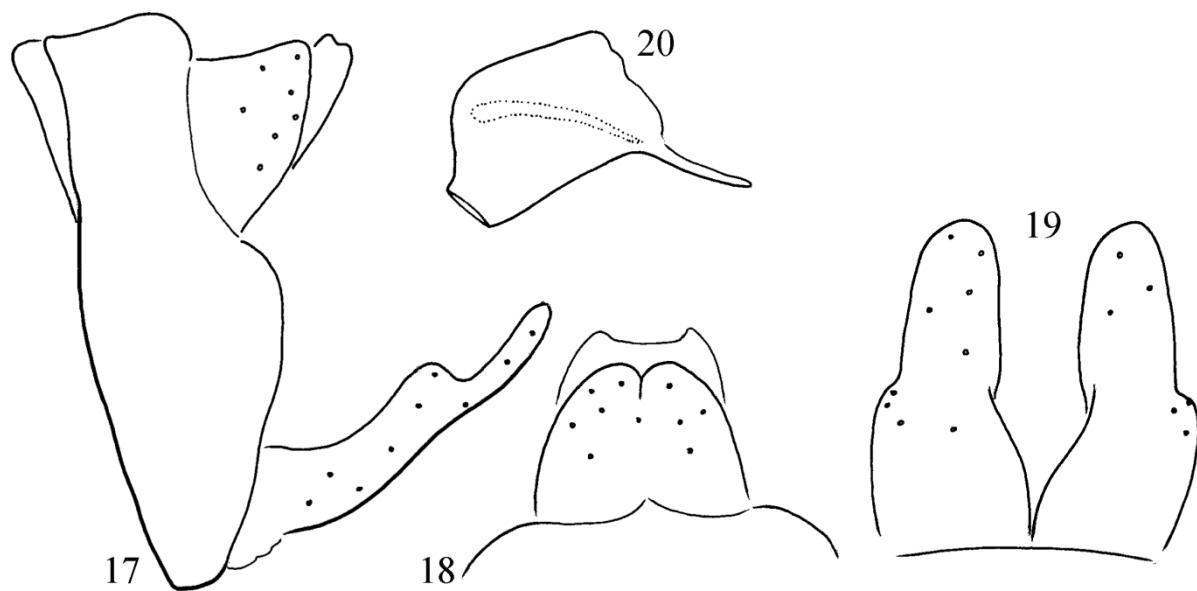
Material examined. Holotype: **India**, Orissa State, near Bhubaneswar, Daya River, 21.II.1985, light leg. J. Oláh (1 male, OPC).

Diagnosis. *Oecetis dhaulia* sp. nov. has resemblance to *Oecetis gujara* sp. nov. but distinguished by the shorter cerci; by the lateral profile of gonopod with more produced subapical dorsal lobe; ventral profile of gonopod with robust, rounded apical half, not slender, narrowing and mesad turning. Phallic organ shorter.

Description. Head, thorax, scape light brown yellowish in alcohol. Forewing rubbed in alcohol, membrane hyaline of 8 mm length, forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX straight anterad, with rounded pleural region posterad. Lateral profile of segment X visible as a setaless continuation of cerci, with upward directed bifid apex; short and wide, mesally excised in dorsal view. Cerci fused to segment X, subtriangular in lateral view. Lateral profile of gonopod two-partite; higher arching basal and digitiform tapering apical region; robust, two-partite in ventral view. Apicoventral lip of the phallic organ obtuse-angled long and slender.

Etymology. Coined after the name of locus typicus, a noun in apposition.



Figures 17–20. *Oecetis dhaulia* sp. nov. Holotype: 17 = male genitalia in left lateral view, 18 = male genitalia in dorsal view, 19 = gonopods in ventral view, 20 = phallic organ in left lateral view.

***Oecetis gujara* sp. nov.**

(Figures 21–24)

Material examined. Holotype: **India**, Gujarat State, Ghandinagar, Sabarmati River, 22.IV.1992, light leg. J. Oláh (1 male, OPC). Paratype: same as holotype (3 males, OPC). India, Rajasthan State, Banswara, Mahi River, 26. IV. 1992, light leg. J. Oláh (3 male, OPC).

Diagnosis. *Oecetis gujara* sp. nov. has resemblance to *Oecetis dhaulia* sp. nov. but is distinguished by the longer cerci; by the lateral profile of gonopod with less produced subapical dorsal lobe; ventral profile of gonopod with slender, narrowing and mesad turning apical half, not robust and rounded. Phallic organ longer.

Description. Head, thorax, scape light brown yellowish in alcohol. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. forewing a-nastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

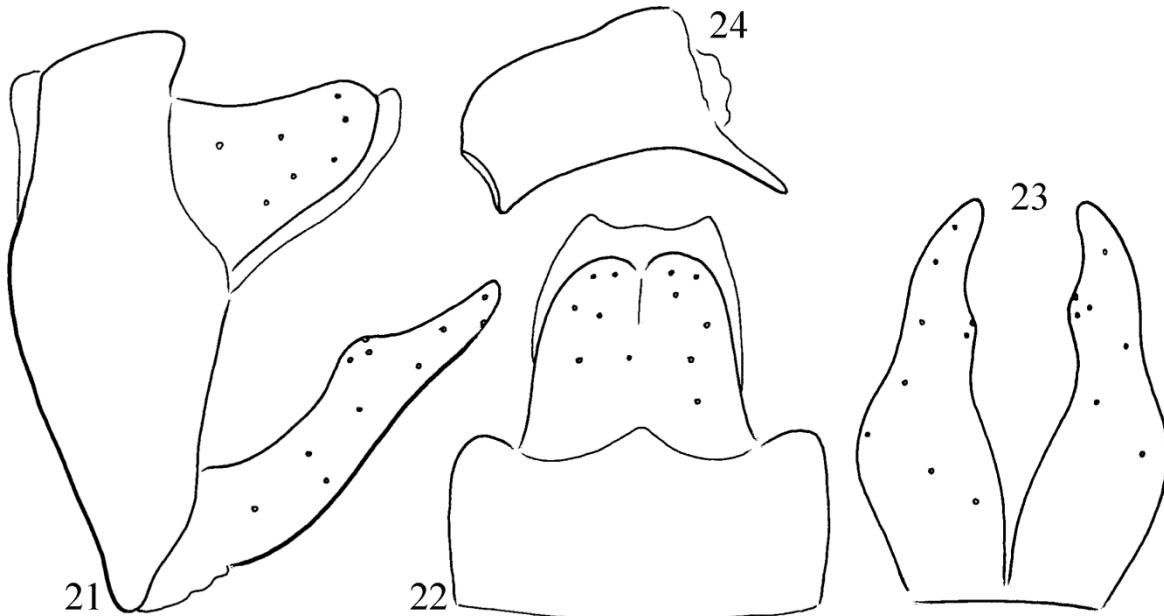
Male genitalia. Segment IX straight anterad, with rounded pleural region posterad; tergum long, ventrum short in lateral view. Lateral profile of segment X visible as a setaless marginal continuation of cerci, with upward directed rounded apex; short and wide, mesally excised in dorsal view. Cerci fused to segment X, elongated in lateral view. Lateral profile of gonopod two-partite; higher arching basal and digitiform tapering apical region; robust, two-partite in ventral view with an additional mesal hump middle on the apical region. Apicoventral lip of the phallic organ very obtuse-angled long and slender.

Etymology. Coined after the name of locus typicus, a noun in apposition.

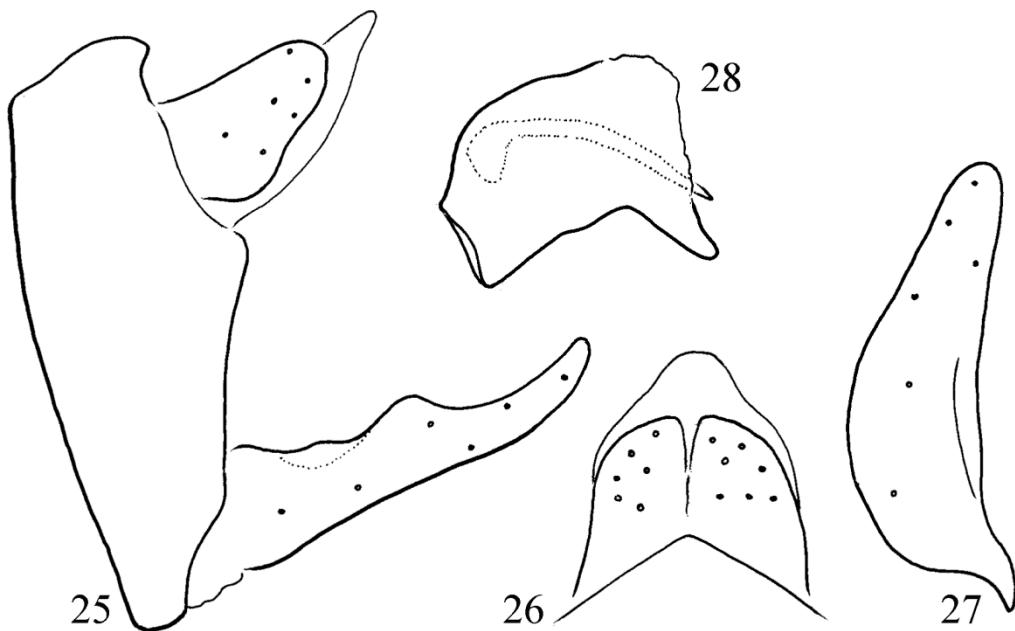
***Oecetis halonga* sp. nov.**

(Figures 25–28)

Material examined. Holotype: **Malaysia**, Perak, Halong stream, 4.XII.1993, light leg. G. Robinson (1 male, OPC). Paratype: Malaysia, Perak, Halong stream, 9.XII.1993, light leg. G. Robinson (1 male, OPC).



Figures 21–24. *Oecetis gujara* sp. nov. Holotype: 21 = male genitalia in left lateral view, 22 = male genitalia in dorsal view, 23 = gonopods in ventral view, 24 = phallic organ in left lateral view.



Figures 25–28. *Oecetis halonga* sp. nov. Holotype: 25 = male genitalia in left lateral view, 26 = male genitalia in dorsal view, 27 = gonopods in ventral view, 28 = phallic organ in left lateral view.

Diagnosis. *Oecetis halonga* sp. nov. has resemblance to *Oecetis dagna* sp. nov. but distinguished by the lower cerci; by the lateral profile of gonopod with pronounced subapical dorsal lobe; ventral profile of gonopod with narrowing, but straight vertical mesal margin, not with mesad turning apical half. Apicoventral lip on phallic organ more right angled, not obtuse angled.

Description. Head, thorax, scape light brown yellowish in alcohol. Forewing rubbed in alcohol, membrane hyaline of 8 mm length, forewing a-nastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX straight anterad, with subtriangular pleural region posterad; tergum long, ventrum short in lateral view. Lateral profile of segment X visible as a setaless marginal continuation of cerci, with tapering apex; short and narrowing with blunt apex in dorsal view. Cerci fused to segment X, elongated with constricted basal region in lateral view. Lateral profile of gonopod with broad basement; undulating dorsum on the basal region and tapering and upward arch-

ing apical region; simple narrowing elongated structure in ventral view. Apicoventral lip of the phallic organ almost right-angled, short triangular in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

Oecetis hoabinha sp. nov.

(Figures 29–32)

Oecetis tripunctata (Fabricius, 1793): Oláh 2013:129. Misidentification.

Material examined. Holotype: **Vietnam**, Hoa Binh Province, 8 km to Dabac, 31.I.1986, light leg. J. Oláh (1 male, OPC). Paratypes: same as holotype (2 males, OPC). Vietnam, Hoa Binh Province, towards Dabac, 21.X.1986, light leg. J. Oláh (2 males, OPC).

Diagnosis. *Oecetis hoabinha* sp. nov. has resemblance to *Oecetis dagna* sp. nov. but distinguished by dorsal profile of segment X rounded, not slightly excised; lateral profile of gonopod with concave, not with almost straight baso-

dorsum; ventral profile of gonopod with simply rounded, not mesad produced apex, and no dorsal lobe visible. Phallic organ with less robust apicoventral lip.

Description. Head, thorax, scape light brown yellowish in alcohol. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. Forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX straight anterad, with rounded pleural region posterad; tergum long, ventrum slightly shorter in lateral view. Lateral profile of segment X visible as a setaless marginal continuation of cerci, with tapering apex; long and narrow with blunt apex in dorsal view. Cerci fused to segment X, subtriangular in lateral view. Lateral profile of gonopod with broad basement, concave dorsum on the basal region and narrow apical region; two partite with broader and longer basal region in ventral view. Apicoventral lip of the phallic organ almost obtuse-angled, short in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

***Oecetis kamba* sp. nov.**

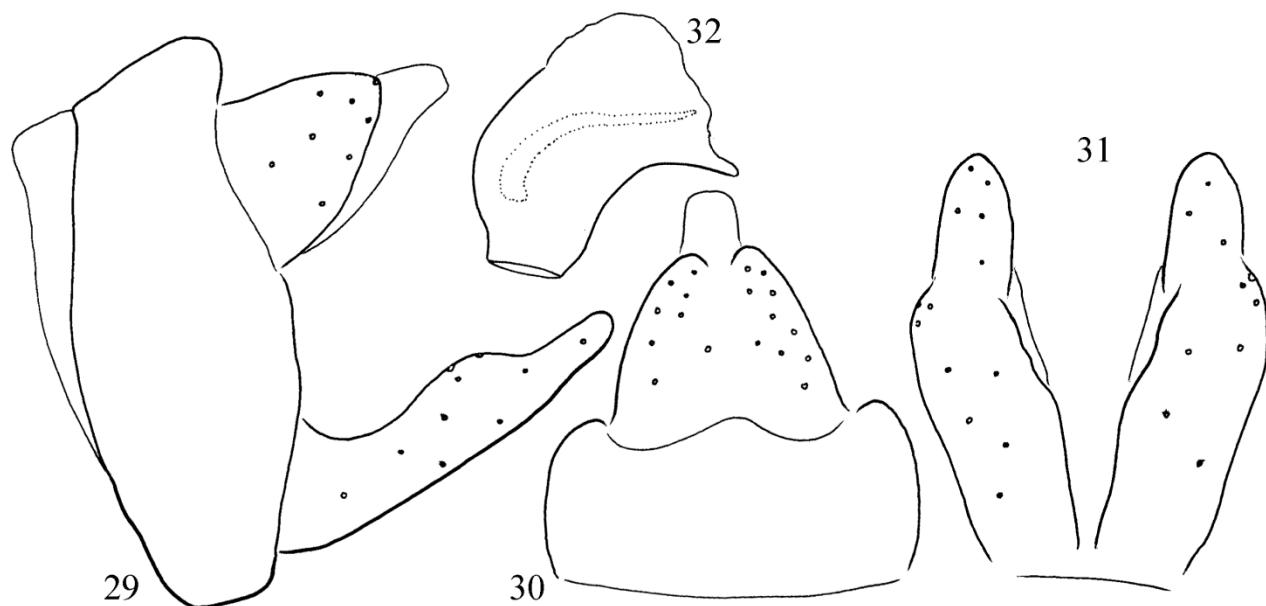
(Figures 33–36)

Oecetis tripunctata (Fabricius, 1793): Oláh & Malicky 2011:22. Misidentification.

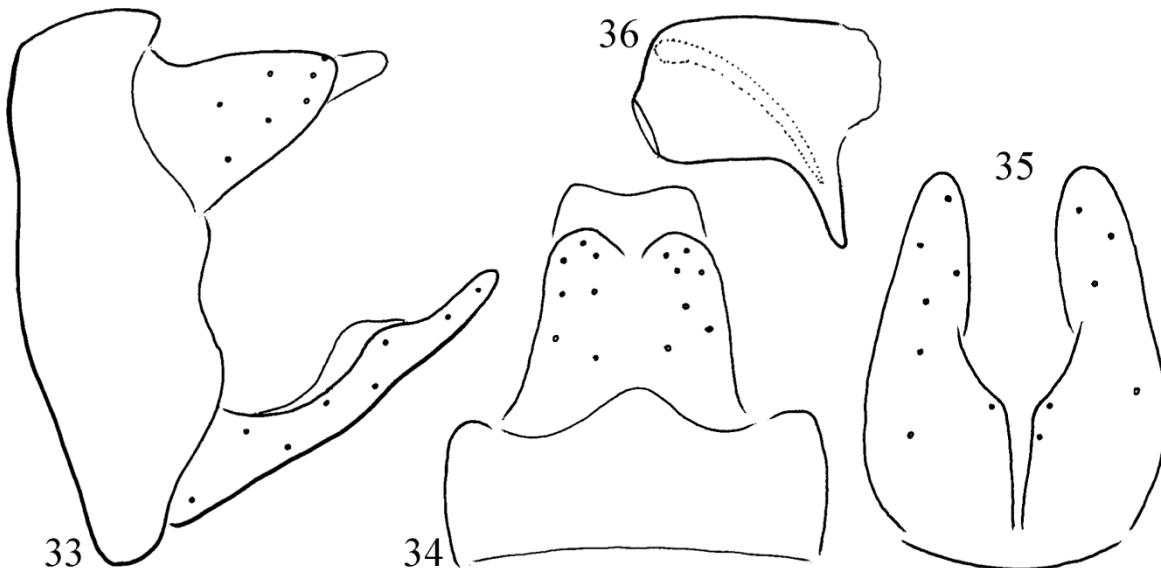
Material examined. Holotype: **Indonesia**, Sumatra, Way Kambas National Park, 22.VI.2009, light trap. leg. Z. Ecsedi (1 male, OPC). Paratypes: same as holotype (8 males, OPC).

Diagnosis. *Oecetis kamba* sp. nov. has resemblance to *Oecetis halonga* sp. nov. but distinguished by wide and excised segment X, not narrow and rounded; by the longer cerci; by the lateral profile of gonopod with more concave dorsum, with pronounced subapical dorsal lobe; ventral profile of gonopod with mesad produced, not with straight vertical basal region. Apicoventral lip on phallic organ slender.

Description. Head, thorax, scape light brown yellowish in alcohol. Forewing rubbed in alcohol,



Figures 29–32. *Oecetis hoabinha* sp. nov. Holotype: 29 = male genitalia in left lateral view, 30 = male genitalia in dorsal view, 31 = gonopods in ventral view, 32 = phallic organ in left lateral view.



Figures 33–36. *Oecetis kamba* sp. nov. Holotype: 33 = male genitalia in left lateral view, 34 = male genitalia in dorsal view, 35 = gonopods in ventral view, 36 = phallic organ in left lateral view.

membrane hyaline of 8 mm length. Forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP₃₊₄, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX straight anterad, with rounded convex pleural region posterad; tergum long, ventrum slightly shorter in lateral view. Lateral profile of segment X visible as short setaless lobe; short and wide with slightly excised truncated apex in dorsal view. Cerci fused to segment X, elongated subtriangular in lateral view. Lateral profile of gonopod slender, upper margin of the mesal lobe visible; two partite with broader and longer basal region in ventral view. Apicoventral lip of the phallic organ almost right-angled, long and strong in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

***Oecetis lata* Johanson, Pham, Malm & Sjöberg,
2020**

Material examined. **Vietnam**, Thai Nguyen Province, Phu Luong, Dang Dat River, 26.V. 1987, light leg. J. Oláh (15 males, OPC).

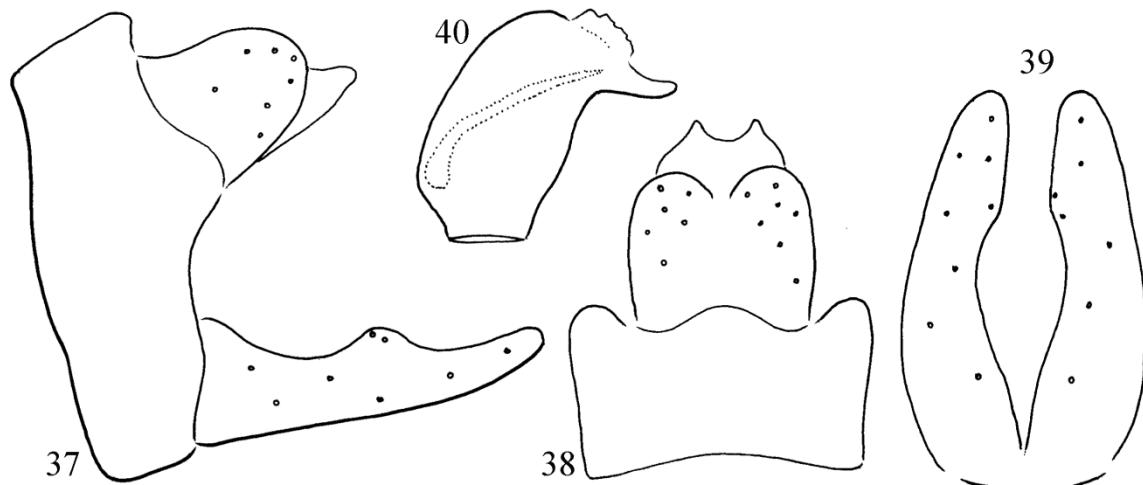
***Oecetis orissa* sp. nov.**

(Figures 37–40)

Material examined. Holotype: **India**, Orissa State, near Bhubaneswar, Daya River, 21.II.1985, light leg. J. Oláh (1 male, OPC). Paratype: same as holotype (23 males, OPC). India, Orissa State, near Bhubaneswar, Dhauli, marsh, 20–28.II.1987, light leg. J. Oláh (1 male, OPC). India, Gujarat State, Ghandinagar, Sabarmati River, 22.IV.1992, light leg. J. Oláh (1 male, OPC).

Diagnosis. *Oecetis orissa* sp. nov. has resemblance to *Oecetis baneshwara* sp. nov. but distinguished by having shorter tergum IX and longer sternum IX; dorsal profile of segment X excised, not truncated; lateral profile of gonopod with straight, not undulating ventrum; ventral profile of gonopod with short, not with long apical mesad produced region. Phallic organ with obtuse angled and robust, not with almost right angled and slender apicoventral lip.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. Forewing anastomosis cross-veins are arranged in stepwise,



Figures 37–40. *Oecetis orissa* sp. nov. Holotype: 37 = male genitalia in left lateral view, 38 = male genitalia in dorsal view, 39 = gonopods in ventral view, 40 = phallic organ in left lateral view.

transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX straight anterad, with rounded triangular pleural region posterad; tergum long, ventrum only slightly shorter in lateral view. Lateral profile of segment X visible as short setaless triangular lobe; short and wide with deeply excised apex in dorsal view. Cerci fused to segment X, semicircular in lateral view. Lateral profile of gonopod with pronounced middle lobe; two partite with mesally extended apical region in ventral view. Apicoventral lip of the phallic organ almost right-angled, robust digitiform in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

Oecetis peraka sp. nov.

(Figures 41–44)

Material examined. Holotype: **Malaysia**, Perak, Halong stream, 21.XI.1993, light leg. G.S. Robinson (1 male, OPC).

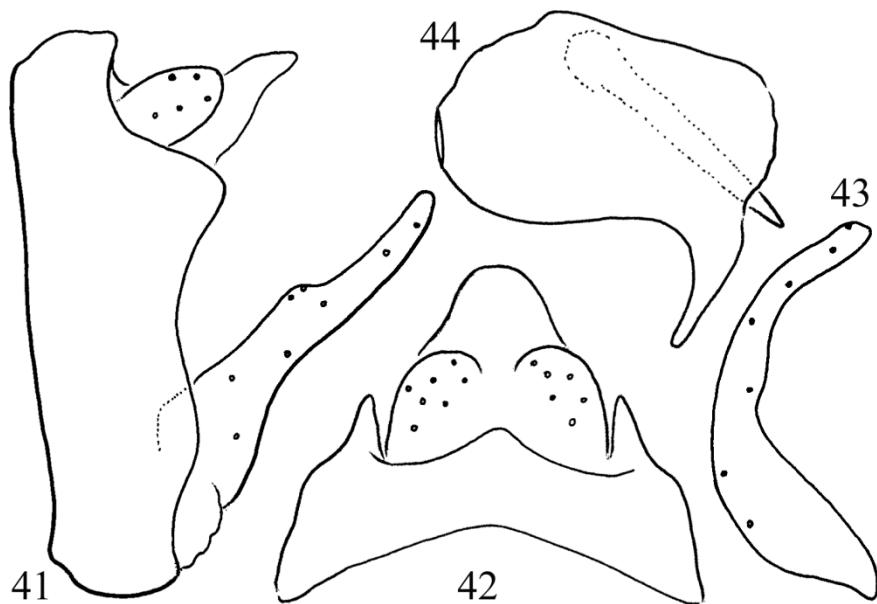
Diagnosis. *Oecetis peraka* sp. nov distinguished from all the known species by having stepwise pattern of cross-veins in anastomosis on

the forewing chimeric, that is the transverse base of MA is distad of transverse base of MP3+4 only a little more than its length; the cerci is small; dorsal profile of segment X rounded; ventral profile of gonopod slender arching laterad, not robust. Phallic organ rather large with anterad turning apicoventral lip.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. Forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by just a little more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX regular straight vertical anterad, with triangular pleural region posterad; tergum slightly shorter than ventrum in lateral view. Lateral profile of segment X visible as a slightly S-formed setaless lobe; with slightly tapering blunt apex in dorsal view. Cerci rather small, fused to segment X, foliform in lateral view. Lateral profile of gonopod slender with small middle lobe; arching mesad in ventral view. Apicoventral lip of the phallic organ rounded-angled, digitiform, downward directed in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.



Figures 41–44. *Oecetis peraka* sp. nov. Holotype: 41 = male genitalia in left lateral view, 42 = male genitalia in dorsal view, 43 = gonopods in ventral view, 44 = phallic organ in left lateral view.

Oecetis prenna sp. nov.

(Figures 45–48)

Oecetis tripunctata (Fabricius, 1793): Oláh 2013:129.
Misidentification.

Material examined. Holotype: **Vietnam**, Lam Dong Province, Dalat, Prenn waterfall, 19.X. 1988, light leg. J. Oláh (1 male, OPC). Paratype: Vietnam, Cuc Phuong National Park, 400 m, 17.X.1986, light leg. J. Oláh (1 male, OPC).

Diagnosis. *Oecetis prenna* sp. nov. has resemblance to *Oecetis halonga* sp. nov. but distinguished by the higher cerci; by the lateral profile of gonopod with pronounced middle constriction; ventral profile of gonopod with narrowing, and slightly mesad turning apical half. Apicoventral lip on phallic organ slender and regularly right angled.

Description. Head, thorax, scape light brown yellowish in alcohol. Forewing rubbed in alcohol, membrane hyaline of 8 mm length, forewing a-nastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base

of MP3+4, by more than its length. Tibial spurs 1,2,2.

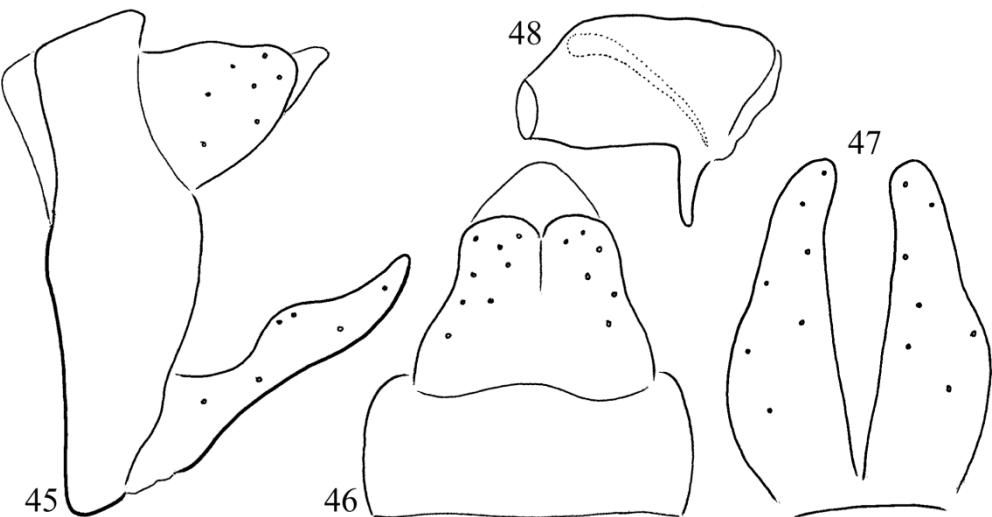
Male genitalia. Segment IX regular straight vertical anterad, with rounded convex pleural region posterad; tergum longer than ventrum in lateral view. Lateral profile of segment X visible as a small narrowing setaless lobe; with subtriangular blunt apex in dorsal view. Cerci large, fused to segment X, foliform in lateral view. Lateral profile of gonopod slender highly constricted before the middle lobe; straight narrowing in ventral view. Apicoventral lip of the phallic organ regular right-angled, digitiform in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

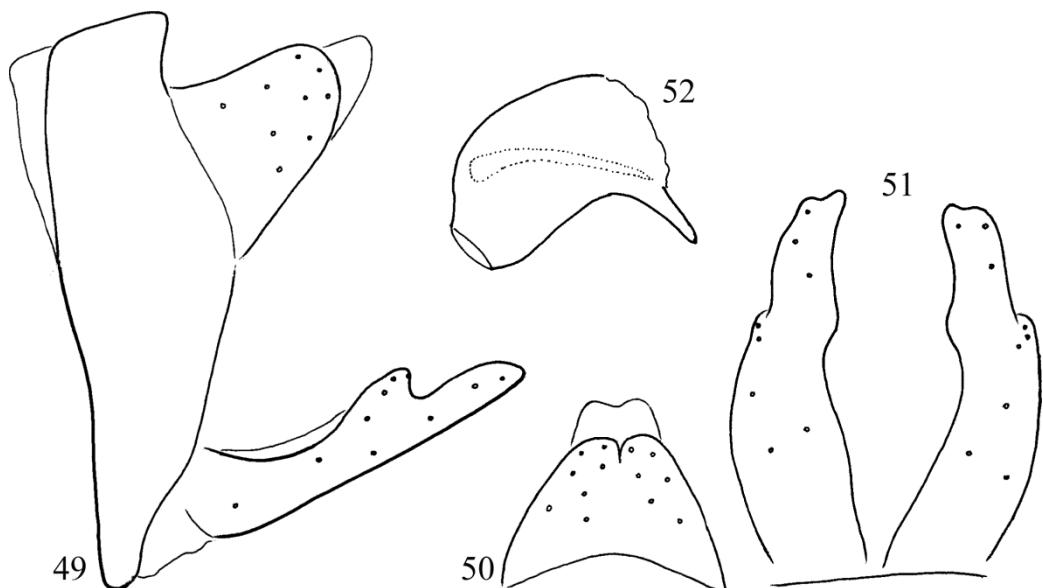
Oecetis sabarma sp. nov.

(Figures 49–52)

Material examined. Holotype: **India**, Gujarat State, Ghandinagar, Sabarmati River, 22.IV.1992, light leg. J. Oláh (1 male, OPC). Paratype: same as of holotype (1 male, OPC).



Figures 45–48. *Oecetis prenna* sp. nov. Holotype: 45 = male genitalia in left lateral view, 46 = male genitalia in dorsal view, 47 = gonopods in ventral view, 48 = phallic organ in left lateral view.



Figures 49–52. *Oecetis sabarma* sp. nov. Holotype: 49 = male genitalia in left lateral view, 50 = male genitalia in dorsal view, 51 = gonopods in ventral view, 52 = phallic organ in left lateral view.

Diagnosis. *Oecetis sabarma* sp. nov distinguished from all the known species by the particularly patterned gonopod both in lateral and ventral view, the subapical dorsal lobe is strongly produced in the lateral profile, as well as the head almost bifid in ventral view; dorsal profile of segment X excised.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. Forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by just a little more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX regular straight vertical anterad, with rounded convex pleural region posterad; tergum longer than ventrum in lateral view. Lateral profile of segment X visible as a small narrowing setaless lobe; with slightly excised blunt apex in dorsal view. Cerci large, fused to segment X, foliform in lateral view. Lateral profile of gonopod slender constricted before the posterad produced middle lobe; particularly patterned apical region in ventral view. Apicoventral lip of the phallic organ right-angled, digitiform in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

Australasian species

Oecetis kokopa sp. nov.

(Figures 53–56)

Oecetis tripunctata (Fabricius, 1793): Oláh & Mey 2013:422. Misidentification.

Material examined. Holotype: Papua New Guinea, East New Britain Provinz, 33 km SW Kokopo Aranam, Rapmarine River, 180 m, 04° 35'56"S 152°06'06"E, 2 III.2000, leg. M. Scharschmidt & F.P. Roick (1male, OPC).

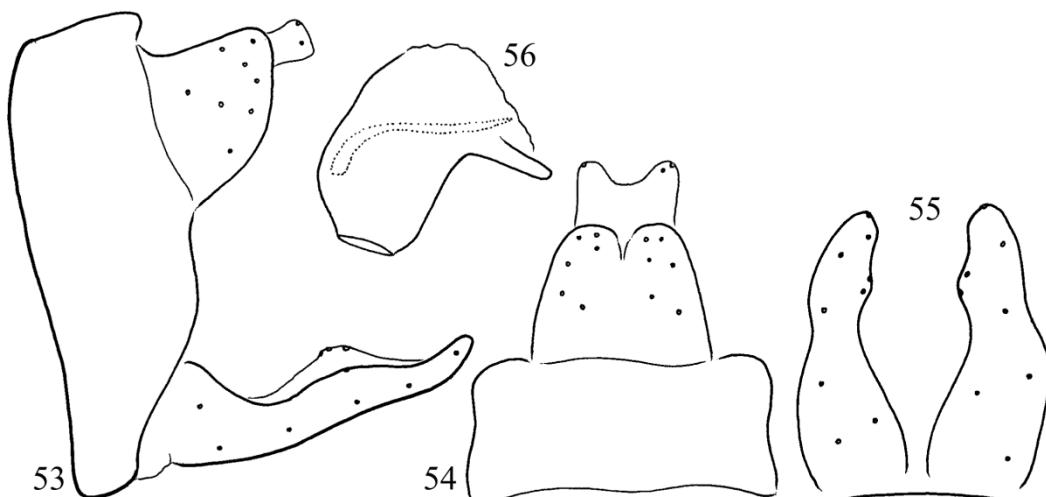
Diagnosis. *Oecetis kokopa* sp. nov. has some

resemblance to *Oecetis parom* sp. nov. but distinguished by having shorter sternum IX; dorsal profile of segment X deeply excised; lateral profile of gonopod with deep dorsal concavity; ventral profile of gonopod with middle constriction. Phallic organ with more robust and right angled apicoventral lip.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. Forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX straight vertical anterad, with rounded convex pleural region posterad; tergum longer than ventrum in lateral view. Lateral profile of segment X visible as a small quadrangular setaless lobe, slightly broadening apicad; with deeply excised apex in dorsal view. Cerci large, fused to segment X, triangular in lateral view. Lateral profile of gonopod with broad basement, less produced middle lobe and well produced mesal margin visible even in lateral view; subapical mesal lobe in ventral view. Apicoventral lip of the phallic organ regular right-angled, digitiform in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.



Figures 53–56. *Oecetis kokopa* sp. nov. Holotype: 53 = male genitalia in left lateral view, 54 = male genitalia in dorsal view, 55 = gonopods in ventral view, 56 = phallic organ in left lateral view.

***Oecetis parom* sp. nov.**

(Figures 57–60)

Material examined. Indonesia, West Papua, Batanta Island, River Waridor, 00°86840"S, 130°52'516"E, 18.I.2013, light trap, leg. Horváth, (1 male, OPC).

Diagnosis. *Oecetis parom* sp. nov. has some resemblance to *Oecetis baneswara* sp. nov. but distinguished by having shorter tergum IX and longer sternum IX; dorsal profile of segment X excised; lateral profile of gonopod with straight, not undulating ventrum; ventral profile of gonopod with straight vertical, not rounded lateral margin, as well as the mesad produced region short and differently shaped. Phallic organ with obtuse angled apicoventral lip.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. Forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX straight vertical

anterad, with almost straight vertical with less produced pleural region posterad; tergum and ventrum almost with the same length in lateral view. Lateral profile of segment X visible as a tapering triangular lobe; with slightly excised apex in dorsal view. Cerci large, fused to segment X, semicircular in lateral view. Lateral profile of gonopod with broader basal two thirds, less produced middle lobe and slender digitiform in lateral view; two-parted in ventral view. Apicoventral lip of the phallic organ rounded right-angled, slender pointed in lateral view.

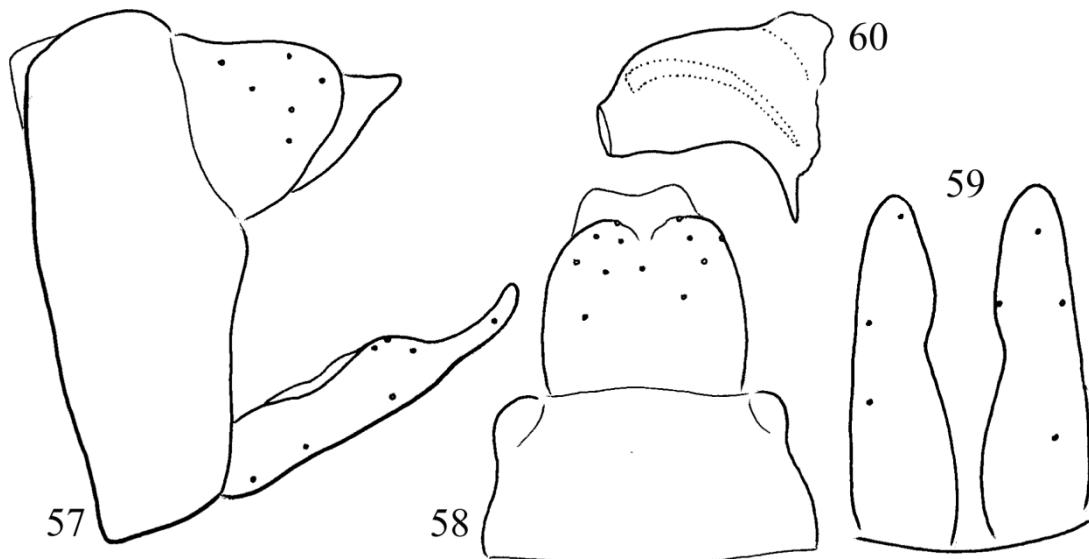
Etymology. I dedicate this particular species from the *Oecetis tripunctata* species group to my wife as we say in Hungarian to my “párom”, a noun in apposition.

Afrotropical species

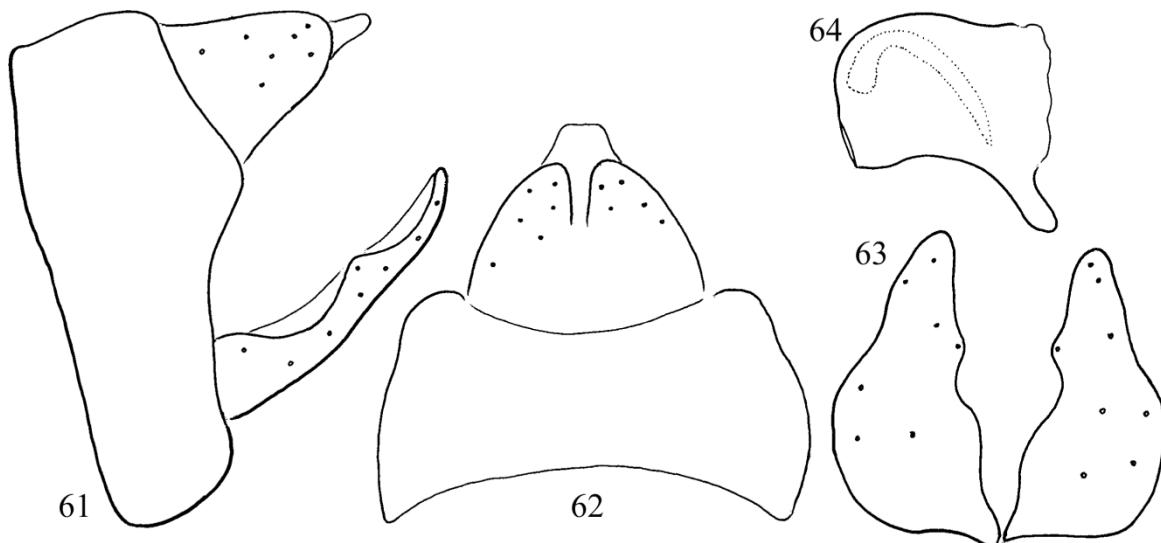
***Oecetis anka* sp. nov.**

(Figures 61–64)

Material examined. Holotype: Madagascar, Ankazoabo Tulear Province, Station Hydrologique du Banian, VII.1957, leg. R. Paulian (1 male, OPC). Paratype: same as holotype (8 males, OPC).



Figures 57–60. *Oecetis parom* sp. nov. Holotype: 57 = male genitalia in left lateral view, 58 = male genitalia in dorsal view, 59 = gonopods in ventral view, 60 = phallic organ in left lateral view.



Figures 61–64. *Oecetis anka* sp. nov. Holotype: 61 = male genitalia in left lateral view, 62 = male genitalia in dorsal view, 63 = gonopods in ventral view, 64 = phallic organ in left lateral view.

Diagnosis. *Oecetis anka* sp. nov. has resemblance to *Oecetis kagerana* Kimmins, 1956 described from Uganda, but distinguished by having cerci longer; dorsal profile of segment X with truncate apex, not excised; lateral profile of gonopod with deep dorsal concavity both basad and apicad of the dorsal subapical lobe, not straight; ventral profile of gonopod more robust. Phallic organ with digitiform, not triangular apicoventral lip.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. Forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX straight vertical anterad, with rounded triangular pleural region posterad; tergum longer than ventrum in lateral view. Lateral profile of segment X visible as a small elongated setaless lobe; with narrowing and truncate apex in dorsal view. Cerci large, fused to segment X, rounded triangular in lateral view. Lateral profile of gonopod with broad basement, less produced middle lobe and well produced mesal margin visible even in lateral view; subapical

mesal lobe in ventral view. Apicoventral lip of the phallic organ regular obtuse-angled, robust and digitiform in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

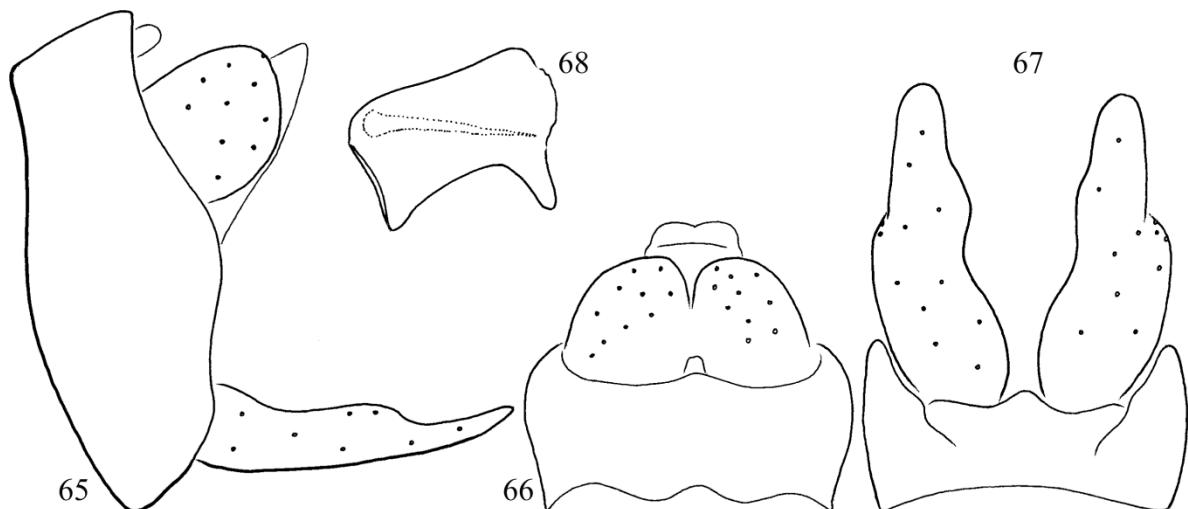
Oecetis banda sp. nov.

(Figures 65–68)

Material examined. Holotype: **Ghana**, Banda-Nkwanta, 13–17.IX.1965, light leg. S. Endrődy Younga (1 male, OPC).

Diagnosis. *Oecetis banda* sp. nov. has resemblance to *Oecetis kagerana* Kimmins, 1956 described from Uganda, but distinguished by having cerci more produced; dorsal profile of segment X wide, not narrowing; lateral profile of gonopod with shallow dorsal concavity basad of the dorsal subapical lobe, not straight; Phallic organ with right-angled, digitiform, not obtuse-angled, triangular apicoventral lip.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. Forewing anastomosis cross-veins are arranged in stepwise,



Figures 65–68. *Oecetis banda* sp. nov. Holotype: 65 = male genitalia in left lateral view, 66 = male genitalia in dorsal view, 67 = gonopods in ventral view, 68 = phallic organ in left lateral view.

transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX slightly convex vertical anterad, with rounded triangular pleural region posterad; tergum longer than ventrum in lateral view. Lateral profile of segment X visible as a small elongated setaless triangular lobe; with short and truncate, slightly bifid apex in dorsal view. Cerci large, fused to segment X, semicircular in lateral view. Lateral profile of gonopod with broad basement, less produced middle lobe and digitiform tapering apical region; bipartite in ventral view. Apicoventral lip of the phallic organ obtuse-angled, robust and digitiform in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

Oecetis bua sp. nov.

(Figures 69–72)

Material examined. Holotype: **Ghana**, Bui Camp, Volta River, 16-20.XI.1965, light leg. S. Endrődy-Younga (1 male, OPC).

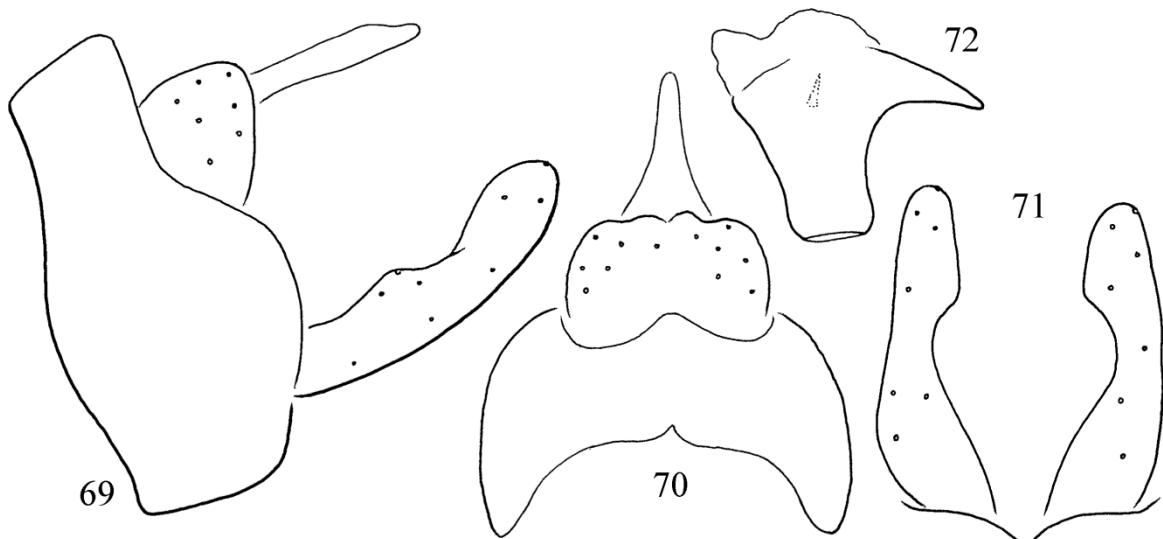
Diagnosis. *Oecetis bua* sp. nov. has resemblance to *Oecetis congana* sp. nov. and *Oecetis volta* sp. nov. The three species are highly chimeric with pronounced apomorphic character states. They have plesiomorphic irregular step-

wise cross-vein pattern on forewing anastomosis, not typical stepwise pattern of the *Oecetis tripunctata* species group; apomorphic character state of the very short, abbreviated paramere; apomorphic character state of the slender, extremely elongated segment X. *Oecetis bua* sp. nov. is distinguished by the spatulate apical region of gonopods, especially in lateral view as well as by the longer and more slender apicoventral lip of phallic organ.

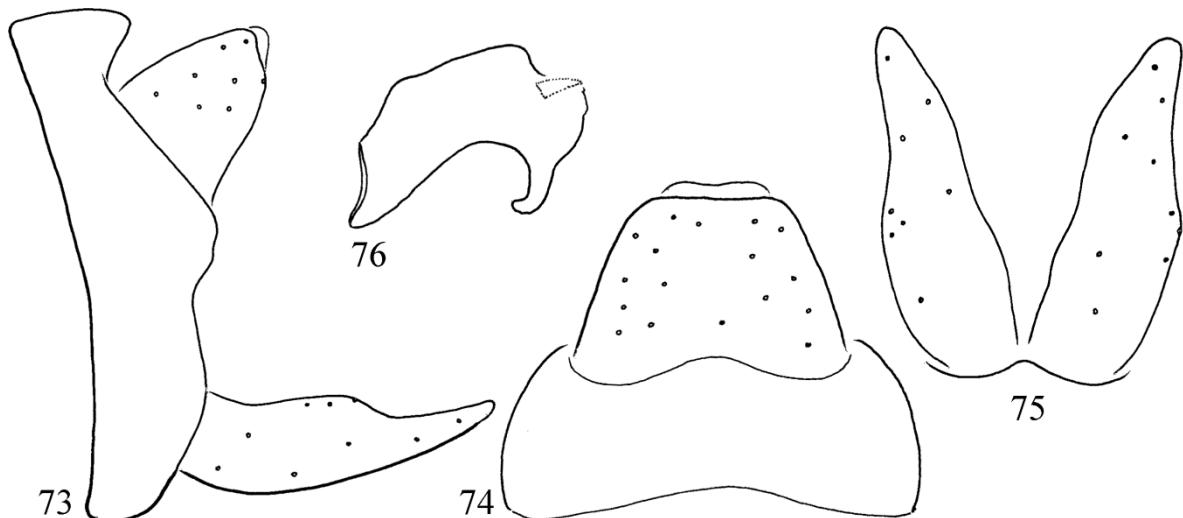
Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 5 mm length. Forewing anastomosis cross-veins are arranged in irregular stepwise pattern. Tibial spurs 1,2,2.

Male genitalia. Segment IX slightly convex vertical anterad, with rounded basal region posterad; tergum shorter than ventrum in lateral view. Lateral profile of segment X visible as a long dititiform structure; long digitiform with broad basement in dorsal view. Cerci large, fused together, semicircular in lateral view. Lateral profile of gonopod with broad apical region; bipartite with mesally extended apical region in ventral view. Apicoventral lip of the phallic organ rounded right-angled, robust, strong tapering digitiform in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.



Figures 69–72. *Oecetis bua* sp. nov. Holotype: 69 = male genitalia in left lateral view, 70 = male genitalia in dorsal view, 71 = gonopods in ventral view, 72 = phallic organ in left lateral view.



Figures 73–76. *Oecetis conga* sp. nov. Holotype: 73 = male genitalia in left lateral view, 74 = male genitalia in dorsal view, 75 = gonopods in ventral view, 76 = phallic organ in left lateral view.

Oecetis conga sp. nov.

(Figures 73–76)

Material examined. Holotype: **Brazzaville-Congo**, Brazzaville, park, 23.XII.1963, light leg. S. Endrődy-Younga (1 male, OPC). Paratype: same as holotype, but: 24.X.1963 (6 males, OPC); 17.XI.1963 (9 males, 1 female; OPC); 19.XI.1963

(2 male, 1 female; OPC); 22.XI.1963 (1 male, OPC).

Diagnosis. *Oecetis conga* sp. nov. has resemblance to *Oecetis bua* sp. nov. and *Oecetis volta* sp. nov. with its apomorphic, abbreviated paramere. However, segment X short and wide, plesiomorphic, not slender and elongated as well as the forewing has cross-vein anastomosis of

typical apomorphic stepwise pattern. This is again a rather chimeric character combination.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 6 mm length. Forewing anastomosis cross-veins arranged in irregular stepwise pattern. Tibial spurs 1,2,2.

Male genitalia. Segment IX slightly concave vertical anterad, with irregular pleural region posterad; tergum longer than ventrum in lateral view. Lateral profile of segment X visible as a small short just visible lobe; short and truncate in dorsal view. Cerci large, fused together and to segment X, subtriangular in lateral view. Lateral profile of gonopod with broad basement, less produced middle lobe and digitiform tapering apical region; tapering in ventral view. Apico-ventral lip of the phallic organ rounded-angled, robust and digitiform with anterad curving apex in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

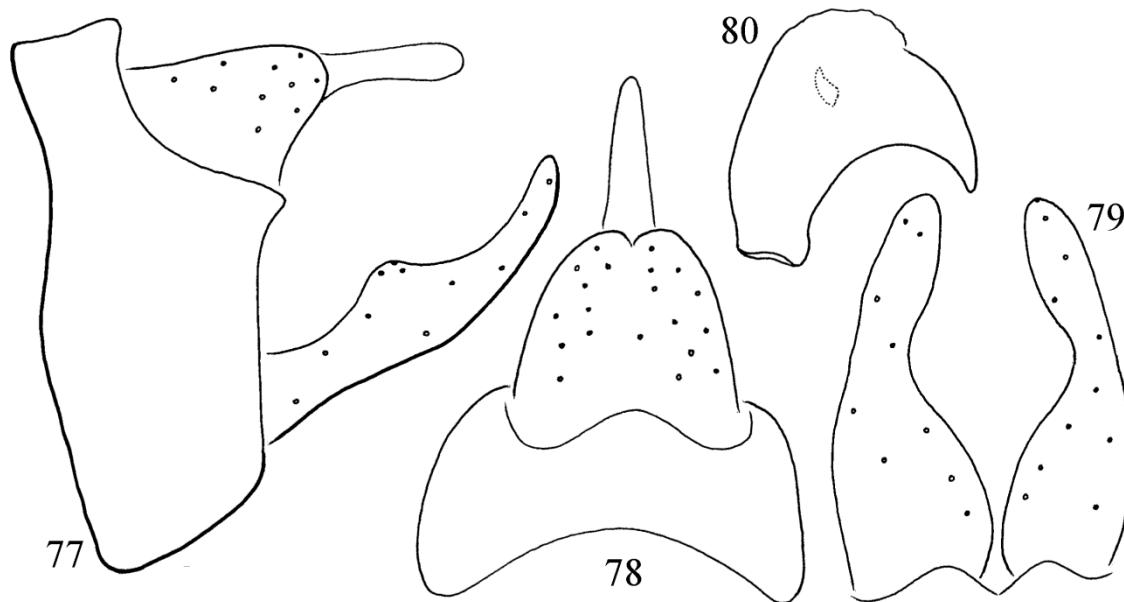
Oecetis congana sp. nov.

(Figures 77–80)

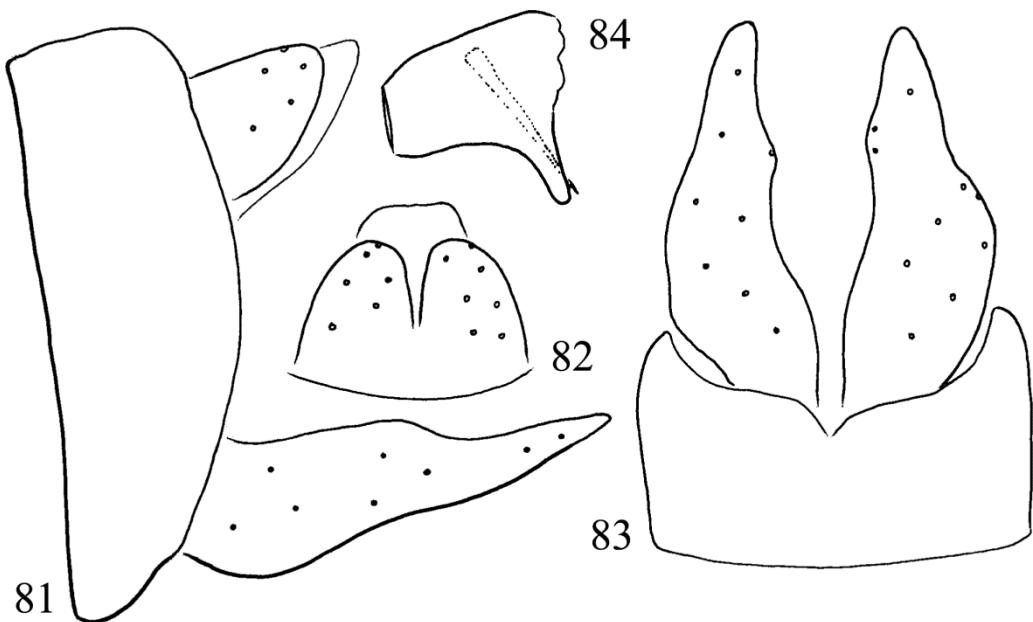
Material examined. Holotype: **Brazzaville-Congo**, Brazzaville, park, 21.XII.1963, light leg. S. Endrődy-Younga (1 male, OPC). Paratype: same as holotype: 19.XI.1963 (1 male, 1 female, OPC); 30.XII.1963 (1 female, OPC).

Diagnosis. *Oecetis congana* sp. nov. has resemblance to *Oecetis bua* sp. nov. and *Oecetis volta* sp. nov. The three species are highly chimeric with pronounced apomorphic character states. *Oecetis congana* sp. nov. is distinguished by the longer cerci, well produced dorsal lobe of gonopod in lateral profile; as well as by the anterad curving and triangularly broad apico-ventral lip of phallic organ.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 6 mm length. Forewing anastomosis cross-veins are arranged in irregular stepwise pattern. Tibial spurs 1,2,2.



Figures 77–80. *Oecetis congana* sp. nov. Holotype: 77 = male genitalia in left lateral view, 78 = male genitalia in dorsal view, 79 = gonopods in ventral view, 80 = phallic organ in left lateral view.



Figures 81–84. *Oecetis ghana* sp. nov. Holotype: 81=male genitalia in left lateral view, 82=male genitalia in dorsal view, 83=gonopods in ventral view, 84=phallic organ in left lateral view.

Male genitalia. Segment IX slightly concave vertical anterad, with sharp triangular pleural region posterad; tergum shorter than ventrum in lateral view. Lateral profile of segment X visible as a long digitiform structure; long and digitiform in dorsal view. Cerci large, fused together and to segment X, subtriangular in lateral view. Lateral profile of gonopod with constricted basement, produced middle lobe and digitiform tapering upward turning apical region; bipartite in ventral view. Apicoventral lip of the phallic organ rounded-angled, robust and triangular with anterad curving apex in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

Oecetis ghana sp. nov.

(Figures 81–84)

Material examined. Holotype: **Ghana**, Bui Camp, Volta River, 16-20.XI.1965, light leg. S. Endrődy-Younga (1 male, OPC). Paratypes: same as holotype (3 males, OPC); same as holotype, but 27.X.1965 (6 males, OPC)

Diagnosis. *Oecetis ghana* sp. nov. has resemblance to *Oecetis kagerana* Kimmins, 1956 described from Uganda, as well as to *Oecetis anka* sp. nov. described here from Madagascar, but distinguished from boths by dorsal profile of segment X with wide and truncate apex, not excised of *O. kagerana* and not narrow of *O. anka*; lateral profile of gonopod without dorsal concavity of *O. anka* and without right-angled dorsal lobe of *O. kagerana*; ventral profile of gonopod with tapering apex. Phallic organ with straight paramere, *O. anka* and *O. kagerana* have basal curved paramere; apicoventral lip of phallic organ digitiform, not triangular like at *O. kagerana* and almost right-angled, not obtuse angled like at *O. anka*.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 5 mm length. Forewing anastomosis cross-veins are arranged in stepwise, transverse base of MA is distad of transverse base of MP3+4, by more than its length. Tibial spurs 1,2,2.

Male genitalia. Segment IX regular straight vertical anterad, rounded posterad; tergum longer than ventrum in lateral view. Lateral profile of

segment X visible as a marginal setaless continuation of cerci; with short and truncate apex in dorsal view. Cerci large, fused to segment X, subtriangular in lateral view. Lateral profile of gonopod with broad basement, less produced middle lobe and digitiform tapering apical region; bipartite in ventral view. Apicoventral lip of the phallic organ rounded right-angled, robust and digitiform in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

***Oecetis kagerana* Kimmins, 1956**

Material examined. **Ghana**, Bui Camp, Volta River, 27.X.1965, light leg. S. Endrődy-Younga (12 males, OPC).

***Oecetis maculipennis* Ulmer, 1922**

Oecetis maculipennis Ulmer, 1922:61–63: “Material: Sudan, 1. Coll. le Roi: 2♀ Bahr el Ghazal 1.III. 1913, abends; 1♀ Bahr el Ghazal 8.III.; 2♂ bahr el Zeral 13.III. 2. Coll. Hesselberger: 6♂♀, Nr. 9, Bahr el Zeral 30.I.1912; 9♂♀, Nr. 11, Shambe

2.II.; 25♂♀, Nr. 14, Shambe 4.II.; 6♂♀, Nr. 25, Shambe 19.II.”

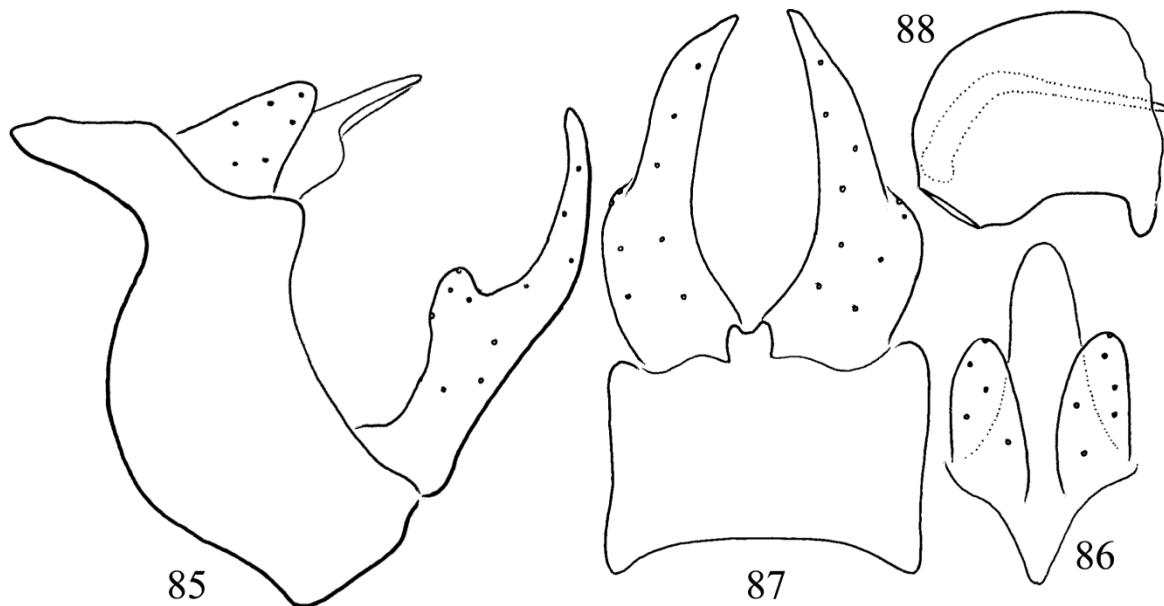
***Oecetis manta* sp. nov.**

(Figures 85–88)

Material examined. Holotype: **Madagascar**, Mantasoa, VIII.1953, leg. J. M. (1 male, OPC). Paratype: same as holotype (1 male, OPC)

Diagnosis. *Oecetis manta* sp. nov. has resemblance to *Oecetis maroa* sp. nov. and *Oecetis zoa* sp. nov. The three species are chimeric with plesiomorphic character state of the rather free cerci, not fused to segment X. *Oecetis manta* sp. nov. is distinguished by the posterad produced dorsal lobe of gonopod in lateral profile; by the almost right angled paramere and the short and blunt apicoventral lip of phallic organ.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. Forewing anastomosis cross-veins are arranged in irregular stepwise pattern. Tibial spurs 1,2,2.



Figures 85–88. *Oecetis manta* sp. nov. Holotype: 85 = male genitalia in left lateral view, 86 = male genitalia in dorsal view, 87 = gonopods in ventral view, 88 = phallic organ in left lateral view.

Male genitalia. Segment IX S-form anterad, tergum shorter than ventrum in lateral view. Lateral profile of segment X with broad basement and narrow continuation; broad, fat digitiform in dorsal view. Cerci small, elongated, subtriangular in lateral view. Lateral profile of gonopod with constricted basement, produced middle lobe and digitiform tapering and upward turning apical region; bipartite in ventral view. Apicoventral lip of the phallic organ right-angled, robust very short digitiform in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

***Oecetis maroa* sp. nov.**

(Figures 89–92)

Material examined. Holotype: **Madagascar**, Maroantsetra, Ambodivoangy, 1955, leg. J. V. (1 male, OPC). Paratype: same as holotype (2 females, OPC).

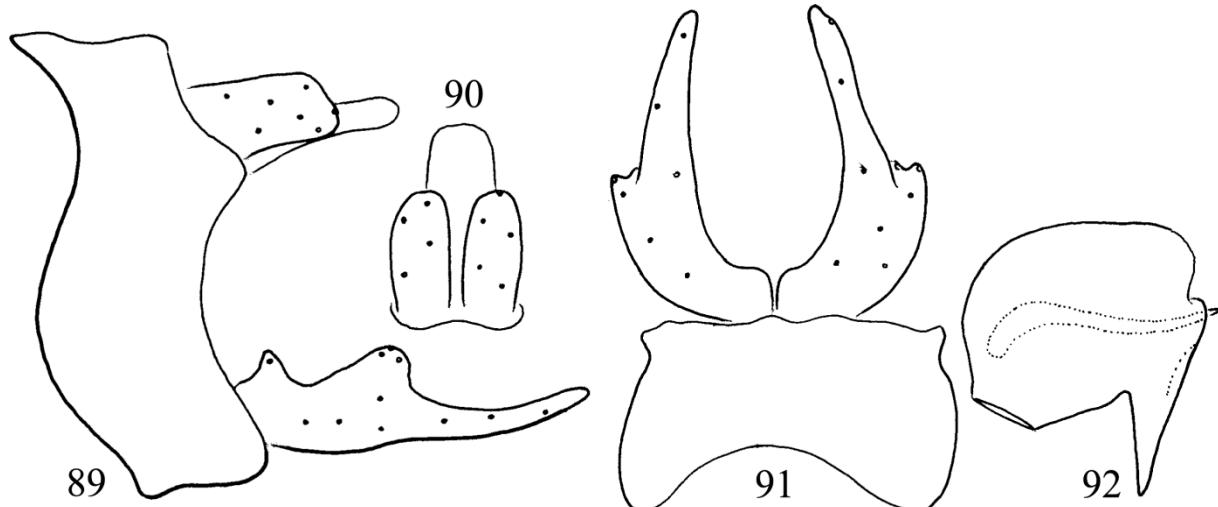
Diagnosis. *Oecetis maroa* sp. nov. has resemblance to *Oecetis maroa* sp. nov. and *Oecetis zoa* sp. nov. The three species are chimeric with plesiomorphic character state of the rather free cerci, not fused to segment X. *Oecetis maroa* sp. nov. is distinguished by the laterad produced dorsal lobe of gonopod well discernible in ventral profile; the presence of the additional basodorsal lobe on gonopods; the anterad directed pointed apicoventral lip of phallic organ.

omomorphic character state of the rather free cerci, not fused to segment X. *Oecetis maroa* sp. nov. is distinguished by the laterad produced dorsal lobe of gonopod well discernible in ventral profile; the presence of the additional basodorsal lobe on gonopods; the anterad directed pointed apicoventral lip of phallic organ.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. Forewing anastomosis cross-veins arranged in irregular stepwise pattern. Tibial spurs 1,2,2.

Male genitalia. Segment IX S-form anterad, tergum as long as ventrum in lateral view. Lateral profile of segment X digitiform; broad, fat digitiform in dorsal view. Cerci small, elongated, subquadangular in lateral view. Lateral profile of gonopod with dorsobasal lobe, produced middle lobe and digitiform tapering and upward turning apical region; bipartite in ventral view. Apicoventral lip of the phallic organ right-angled, long narrowing in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.



Figures 89–92. *Oecetis maroa* sp. nov. Holotype: 89=male genitalia in left lateral view, 90=male genitalia in dorsal view, 91=gonopods in ventral view, 92=phallic organ in left lateral view.

***Oecetis volta* sp. nov.**

(Figures 93–96)

Material examined. Holotype: **Ghana**, Bui Camp, Volta River, 16-20.XI.1965, light leg. S. Endrődy-Younga (1 male, OPC).

Diagnosis. *Oecetis volta* sp. nov. has resemblance to *Oecetis bua* sp. nov. and *Oecetis congana* sp. nov. The three species are highly chimeric with pronounced apomorphic character states. *Oecetis volta* sp. nov. is distinguished by the short cerci, long apical region of gonopods; as well as by the downward directed, robust and short apicoventral lip of phallic organ.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 6 mm length. Forewing anastomosis cross-veins are arranged in irregular stepwise pattern. Tibial spurs 1,2,2.

Male genitalia. Segment IX slightly concave vertical anterad, rounded basal region; tergum shorter than ventrum in lateral view. Lateral profile of segment X digitiform; broad based and tapering in dorsal view. Cerci small, semicircular in lateral view. Lateral profile of gonopod with broad basement, less produced middle lobe and

long digitiform apical region; bipartite in ventral view. Apicoventral lip of the phallic organ right-angled, robust, triangular in lateral view.

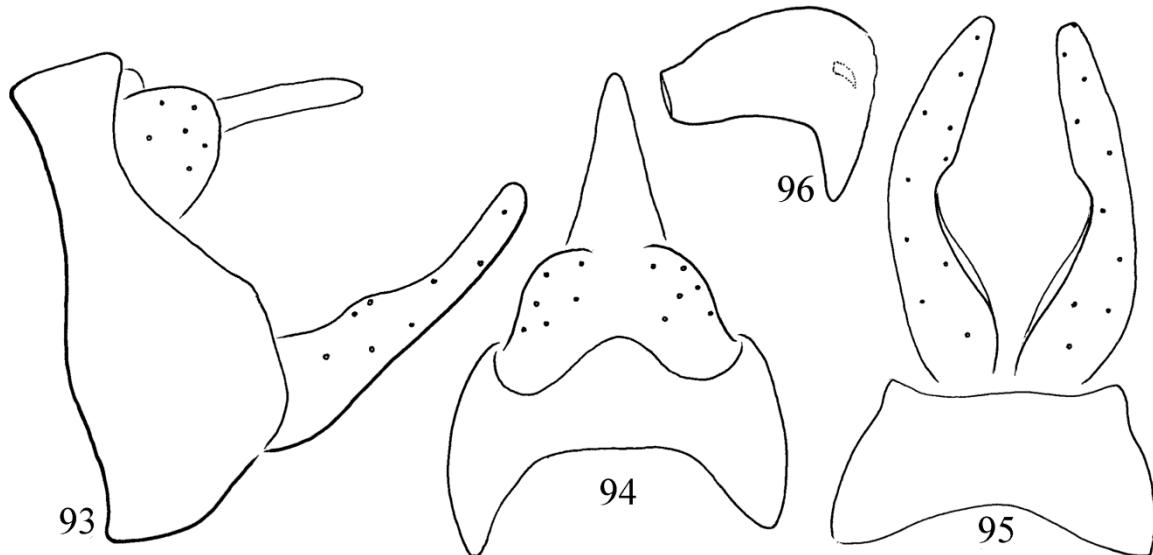
Etymology. Coined after the name of locus typicus, a noun in apposition.

***Oecetis zoa* sp. nov.**

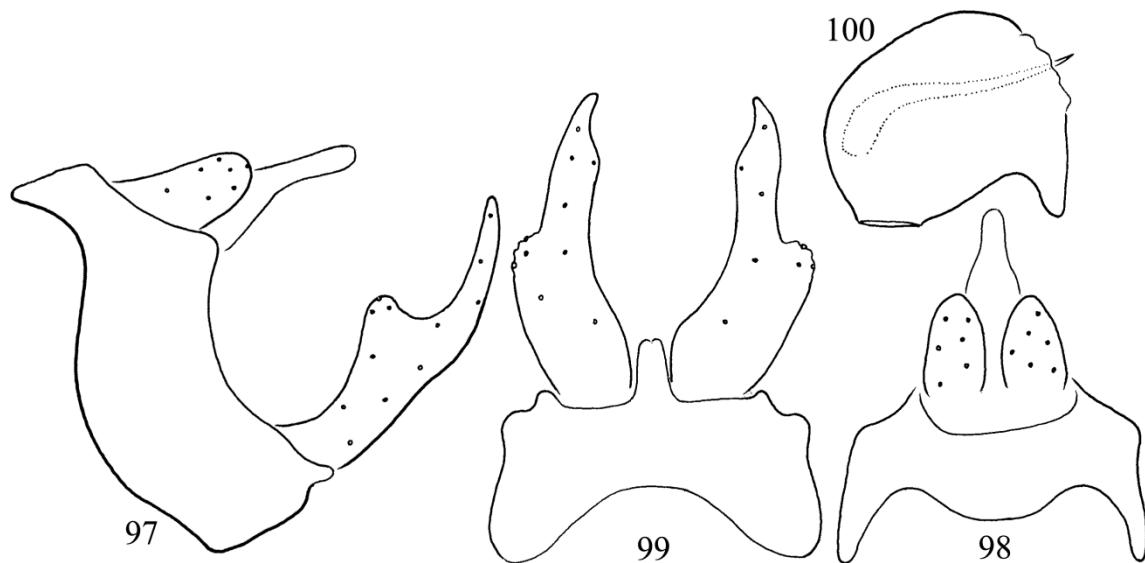
(Figures 97–100)

Material examined. Holotype: **Madagascar**, Ankazoabo Tulear Province, Station Hydrologique du Banian, VII.1957, leg. R. Paulian (1 male, OPC). Paratypes: same as holotype (1 male, OPC). Madagascar, Mantasoa, VIII. 1953 leg. J. M. (1 male, OPC).

Diagnosis. *Oecetis zoa* sp. nov. has resemblance to *Oecetis manta* sp. nov. and *Oecetis maroa* sp. nov. The three species are chimeric with plesiomorphic character state of the rather free cerci, not fused to segment X. *Oecetis zoa* sp. nov. is distinguished by the pointed and mesad excised head of gonopod in ventral profile; by the presence of the apicomesal digitiform process on ventrum IX; by the short and blunt apicoventral lip of phallic organ accompanied by paramere with basal curve.



Figures 93–96. *Oecetis volta* sp. nov. Holotype: 93 = male genitalia in left lateral view, 94 = male genitalia in dorsal view, 95 = gonopods in ventral view, 96 = phallic organ in left lateral view.



Figures 97–100. *Oecetis zoa* sp. nov. Holotype: 97 = male genitalia in left lateral view, 98 = male genitalia in dorsal view, 99 = gonopods in ventral view, 100=phallic organ in left lateral view.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 8 mm length. Forewing anastomosis cross-veins are arranged in irregular step-wise pattern. Tibial spurs 1,2,2.

Male genitalia. Segment IX S-form anterad, tergum shorter than ventrum in lateral view. Lateral profile of segment X with broad basement and narrow continuation; broad, fat digitiform and tapering in dorsal view. Cerci elongated, foliform in lateral view. Lateral profile of gonopod with constricted basement, produced middle lobe and digitiform tapering and upward turning apical region; bipartite in ventral view. Apicoventral lip of the phallic organ right-angled, robust, short digitiform in lateral view.

Etymology. Coined after the name of locus typicus, a noun in apposition.

Oecetis (*O.*) *kimminsiana* species group

This species group was established by Chen (1993) in his PhD Thesis work and listed by Yang and Morse (2000) as *Oecetis maculipennis* relying on the Kimmins's drawings drawn not from the type of *Oecetis maculipennis* Ulmer, 1922 collected in Sudan, but from specimen collected from

Uganda. I have recognised that *Oecetis maculipennis* Ulmer, 1922 is a typical species of the *Oecetis tripunctata* group and specimen from Uganda drawn and identified by Kimmins (1962) as *Oecetis maculipennis* is a new species described here as *Oecetis kimminsiana* sp. nov. The group was created by Chen (1993) examining the drawings of *Oecetis kimminsiana* sp. nov. misidentified by Kimmins as *Oecetis maculipennis* Ulmer, therefore here I change the species group name accordingly: *Oecetis* (*O.*) *kimminsiana*.

The species group is characterized by gonopods with mesal edges of mesobasal lobes sharply toothed and approximate for no more than 1/4 in their length in ventral view; phallus with left anterior lobe sclerotized. This *Oecetis* group is distributed in the Afrotropical Region with four known species: *Oecetis jasikana* Gibbs, 1973 (Ghana); *O. kimminsiana* sp. nov. (Uganda); *O. nkwanza* sp. nov. (Ghana); *O. sunyai* Gibbs, 1973 (Ghana).

Oecetis kimminsiana sp. nov.

Oecetis maculipennis Ulmer, 1922: Kimmins 1962: 113: "Specimens from Uganda and Ghana determined by myself as *maculipennis* agree fairly well with Ulmer's figures." "The chief difference be-

tween these figures and those given by Ulmer is that in ventral view the claspers are incurved apically, not divergent as shown by Ulmer." Misidentification.

Material examined. Specimen from Uganda, Lake Victoria deposited in the British Museum (Natural History).

Diagnosis. Specimen from Uganda drawn and identified by Kimmins (1962) as *Oecetis maculipennis* Ulmer from Sudan is a distinct species described here as *Oecetis kimminsiiana* sp. nov. It has resemblance to *Oecetis maculipennis* Ulmer, 1922, but differs by having lateral profile of gonopod with very broad basement, not simple elongated shape as of *O. maculipennis* Ulmer, that is almost identical to the gonopod plane of the *Oecetis tripunctata* species group, without broad basement. In ventral view the basal region touching mesad and with teeth, not separated and slightly and gradually broadening basad as drawn for *O. maculipennis* Ulmer. The lateral profile of the phallic organ at *Oecetis kimminsiiana* sp. nov. is gradually rounded downward, not right-angled rounded downward that is drawn by Ulmer for *Oecetis maculipennis*.

Description. Description is based upon the original wing and genital drawings (Kimmins

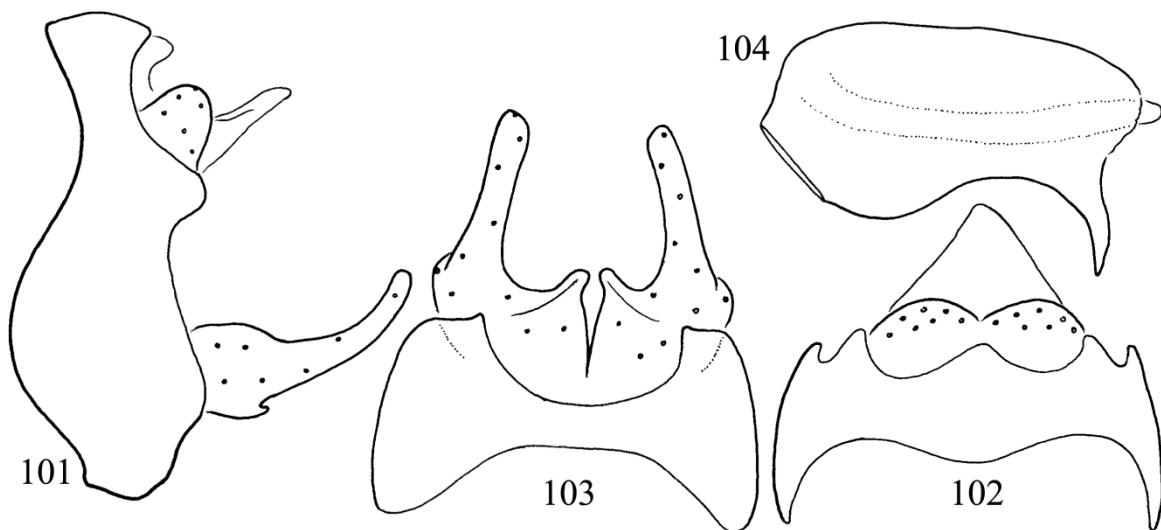
1962:111: figures: 81C, 112: figures: 81F,G; 114: figures 81 K, L, M). Anastomosis cross-veins with irregular stepwise pattern. Segment IX narrow with much produced almost elongated lobe-like process on dorsal apicopleural region; cerci completely fused to segment X, segment X truncated in dorsal view; lateral profile of gonopod with very broad base demarcated both by dorsal and ventral lobe; ventral profile with touching toothed basement. Phallic organ short with downward curving and pointed apicoventral lip.

Oecetis nkwanta sp. nov.

(Figures 101–104)

Material examined. Holotype: **Ghana**, Banda-Nkwanta, 9–12.IX.1965, light leg. S. Endrődy-Younga (1 male, OPC).

Diagnosis. *Oecetis nkwanta* sp. nov. has resemblance to *Oecetis sunyani* Gibbs, 1973 but differs by cerci short, not long; dorsal profile of segment X triangular, not quadrangular; the gonopods differ significantly both in dorsal and lateral views; the mesal digitiform process on the basal enlargement of gonopod single and larger, not doubled and short; phallic organ longer, apicoventral lip slender, not robust; paramere inside the phallic organ with blunt apex, not spine-like pointed.



Figures 101–104. *Oecetis nkwanta* sp. nov. Holotype: 101 = male genitalia in left lateral view, 102 = male genitalia in dorsal view, 103 = gonopods in ventral view, 104 = phallic organ in left lateral view.

Description. Head, thorax, scape yellowish light brown. Forewing rubbed in alcohol, membrane hyaline of 9 mm length. Forewing anastomosis cross-veins are arranged in irregular stepwise pattern. Tibial spurs 1,2,2.

Male genitalia. Segment IX narrow, S-form anterad, biconcave posterad; cerci fused to segment X, segment X regular triangular in dorsal view; lateral profile of gonopod with very broad base demarcated both by dorsal and ventral lobe; ventral profile with touching toothed basement. Phallic organ short with downward curving and pointed apicoventral lip.

Etymology. Coined after the name of locus typicus, a noun in apposition.

Oecetis sunyani Gibbs, 1973

Material examined. **Ghana**, Bui Camp, Volta River, 27.X.1965, light leg. S. Endrődy-Younga (11 males, OPC).

Acknowledgement – Taxonomic revisions depend on specimens. Unfortunately the sampling capacity in taxonomy is symptomatically extremely poor, limited and rapidly declining in our western culture. The present survey only covers less than ten percent of the possible potential diversity of the *Oecetis tripunctata* species complex due to the highly limited sampling coverage. Most of the specimens for this world-wide survey were collected by great collectors, the French R. Paulian (Madagascar) and the Hungarian S. Endrődy-Younga (Africa). Their personal endeavour is highly acknowledged and I am deeply grateful to them. The Oriental faunal region was sampled mostly in India and Vietnam relying on my own resources as well as the first specimens of *Oecetis* (*Oecetis*) *tripunctata* (Fabricius, 1793) were collected by me some 60 years ago when I was 20 years old and just started my university studies. In summer of 1962 I have collected by netting 4 males and 2 females along the Hortobágy-Berettyó canal of the Hungarian Lowland at my

home village, Bucsa. I still remember the details of my first caddisfly collection. Here I take the opportunity to thank my mother for generating and strengthening my devotion to science and caddisflies.

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